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MEDICAL RESEARCH IN ITS RELATION TO MEDICAL SCHOOLS *

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One of the striking features of the phenomenal development which medicine has undergone in recent years is the diminishing emphasis laid on it as an art and the increasing emphasis laid on it as a science. This has come about through a great growth of the spirit of research and a great increase in its achievements. The change is found in all countries, but is especially marked in America, where the development of research had previously been slow. The greater bulk of medical research has been, and is still being, carried on in medical schools, although the gradual increase in the number of independent research foundations has resulted in augmenting greatly the mass of original contributions to medicine.

This investigative feature of modern medicine naturally raises the general question of medical research in its relation to medical schools. Such a broad inquiry resolves itself into a number of component questions, such as: Shall the schools devote their energies solely to teaching? If not, how and to what extent shall they encourage research? Shall all, or only certain, schools undertake research? If undertaken, by whom shall it be carried on? Shall there be within the schools professorships or other positions devoted to research alone and distinct from teaching positions, and departments of research distinct from teaching departments? What is to be the relation of medical schools to research foundations? It is the purpose of this report to present the topic in its various relations and afford grounds for its fuller discussion.

SERVICE RENDERED BY RESEARCH

It will be well early in the report to analyze somewhat the conception of research. There are two ways of looking at the phenomena of nature — here we include all those natural phenomena which constitute medicine in its broad sense — and, correspondingly, those who engage in the study of natural phenomena may be divided, more or less definitely, into two classes. Those of the one class are content to dwell on present knowledge and to follow the beaten path. For them, present knowledge is sufficient in itself. They derive satisfaction from its acquisition, from the appreciation of the order and the relationships of things as they now appear, and some of them also from the utilization of present knowledge in the service of mankind. Those of the other class, while appreciating and utilizing present knowledge, regard it not as a finality but as a means to an end, the end being the acquisition of new knowledge.

These two mental attitudes toward natural phenomena and their followers may be called, respectively, the static and the dynamic. The static man of science is the contemplator of the known; the dynamic man of science is the investigator. With the investigator, existing knowledge never wholly satisfies. He is ever longing for something beyond the limits of the known. Even the static man of science may go as far as this. He may have aspiration, and aspiration means something beyond the dead level of existence, even if it never achieves. Those are numerous who desire to investigate but never make or utilize the opportunity to do so. No one can long conduct a laboratory without meeting the dreamer, the man who has visions of achievement. The value of his aspiration and his dreams appears when he is set to work at a laboratory table and is made to submit his visions to rigid tests exactly controlled. With the investigator, aspiration does not end in dreaming. Imagination he must have — this is one thing that lifts him above the level of his plodding fellows. With imagination there should be the ability to form hypotheses, and then the willingness and the perseverance to submit his hypotheses to actual trial. Thus he is led to institute a systematic search for new things, to undertake a specific inquiry into something that is unknown, and if he is successful, to make known to others the results of his work. The published paper is the tangible evidence of the research.

The spirit of research means all of these things, and when it is fully developed in the individual it endows him with a large breadth of outlook and an unquenchable desire to extend the boundaries of knowledge. The spirit of research is a mental attitude, but it is not one that comes to its possessor as only a spontaneous gift of nature. It may, indeed, come thus and it may be transmitted from father to son; but, on the other hand, it may result from training. Whether a man's future outlook is to be narrow or broad is decided, probably with most persons, during the formative period of his scientific conceptions. Whether he shall become a static or a dynamic man of science

* Report of the Committee on Medical Research of the Association of American Medical Colleges, Frederic S. Lee, Chairman, presented at the annual meeting of the association, Chicago, Feb. 6, 1917.

depends largely on the way in which in his student days he has been taught to look at science. Thus the responsibility resting on his instructors is great. The teaching of even the elements of a science may be from either the static or the dynamic point of view, and the beginnings of the future investigator may thus be laid in the classroom. All of these considerations apply equally to whatever branch of science one may elect to follow, to the follower of medical science as to any other.

MEDICINE AND THE UNIVERSITY

In the past, science, like all other branches of human learning, has been fostered mainly by the universities, and this is probably true of medical science as well. Although numberless important medical discoveries have been made outside academic circles, it doubtless remains true that the greater volume of original contributions to medicine has been made under the influence of the universities. In the United States the medical schools were at first slow to appreciate the advantages of university connections; but in recent years they have experienced a great change of heart, and the independent school is rapidly ceasing to be. Thus here, as elsewhere, the home of the medical schools will, in the future, be within the universities.

RESEARCH IN OR OUTSIDE OF UNIVERSITIES

The question may here be raised whether or not the schools will continue to be the chief seats of medical advance. The establishment of special research foundations, under the various names of institutes, commissions, laboratories and other titles, constitutes a notable feature of recent medicine. They have increased greatly in number, especially in America, and have become a powerful agency in medical progress. Their success forces on us the question whether they will not gradually usurp the research functions of the schools and themselves make the chief contributions to future medicine. It is desirable, therefore, to look into the nature and the relations of such organizations.

There exist in the United States at the present time, apart from fellowships and scholarships, approximately twenty-six special foundations which are engaged primarily in medical research. These are given in the accompanying tabulation.

A noticeable feature of this list is that more foundations for research exist inside than outside universities, the proportion in the two groups being about 2:1. Most of the foundations have been established by single individuals and are supported by the wealth of their founders. With few striking exceptions their funds are comparatively limited, and they are not apt to be increased by donations from other than the original sources. It seems probable, therefore, that in the future, although here and there very wealthy philanthropists may still establish research institutions independent of the universities, they will not multiply considerably.

There are many advantages in university ties for research foundations. Through an encouraging appreciation and illustrious examples the university tradition is favorable to research; a wise administration of the funds given for research is assured; large libraries are directly available; investigators in science allied to medicine are at hand for consultation and stimulus; but especially important is the facility for coming into touch with young men whose careers are not yet determined and, consequently, the possibility of influencing them in the direction of a scientific career. Medical investigators isolated from university relationships are liable to fail in the important service of discovering and developing investigators — they must depend on medical schools for the recruiting of their own ranks. There is thus every reason to believe that the medical schools will continue to be not only the chief communicators of medical learning, but also the chief promoters of medical advance.

RESEARCH A DUTY OF THE MEDICAL SCHOOL

Even, however, if they are not so fortunate as to possess special foundations for research, the medical schools have a much greater duty to perform for the medical profession and the world at large than the routine teaching of medicine as it is. This has been their traditionary feature; to it everything else has been subordinated. There may be those still existing who believe that a school should be only a teaching institution and that its teaching functions would be imperiled if its teachers should allow themselves to be led away by the desire to investigate. To this it can be replied that never yet has a purely teaching institution in an actively changing science been able long to maintain itself as an exponent of the science of the day. It cannot keep pace with progress and must inevitably be left behind. Moreover, with medical tradition being broken every day and the demand for opportunities for research becoming constantly more insistent, it is daily becoming more difficult for the schools to remain mere teaching institutions. It is not to decry their teaching function if we point out that research has become for them a duty. Indeed, if only we perceive that the inevitable result of greater knowledge of disease will be greater power to control its ravages, we are obviously under a moral obligation

FOUNDATIONS FOR MEDICAL RESEARCH

Name	Location	University Affiliation
William T. Bull Memorial Fund	New York	Columbia
George Crocker Special Research Fund	New York	Columbia
Harriman Research Laboratory (Roosevelt Hospital)	New York	None
Huntington Fund for Cancer Research	New York	Cornell
Loomis Laboratory	New York	Cornell
International Health Board of the Rockefeller Foundation	New York	None
Rockefeller Institute for Medical Research	New York	None
Russell Sage Institute of Pathology	New York	None
Henry Phipps Institute for the Study, Prevention and Treatment of Tuberculosis	Philadelphia	Pennsylvania
John Herr Musser Department of Research Medicine	Philadelphia	Pennsylvania
William Pepper Laboratory of Clinical Medicine	Philadelphia	Pennsylvania
Wistar Institute of Anatomy and Biology	Philadelphia	None
James A. Patten Fund for Medical Research	Chicago	Northwestern
Memorial Institute for Infectious Diseases	Chicago	None
Otho S. A. Sprague Memorial Institute	Chicago	Chicago
Nelson Morris Memorial Institute for Medical Research	Chicago	None
Cancer Commission	Boston	Harvard
Nutrition Laboratory of the Carnegie Institution	Boston	None
Phipps Fund for the Study of Tuberculosis	Baltimore	Johns Hopkins
Phipps Psychiatric Clinic	Baltimore	Johns Hopkins
Coffin Research Fund	San Francisco	Leland Stanford
George William Hooper Foundation for Medical Research	San Francisco	California
Francis E. Loomis Fund	New Haven	Yale
New York State Institute for Malignant Disease	Buffalo	None
H. K. Cushing Laboratory of Experimental Medicine	Cleveland	Western Reserve
Mayo Foundation	Rochester	Minnesota

to secure more knowledge, which is quite as imperative as our obligation to relieve suffering by methods already known to be efficacious.

The results of advance in science and the effects of medical and surgical practice are the same — the lessening of disease and suffering and the prolongation of life. The chief difference between the two is that whereas practice by established methods in the main concerns comparatively few individuals, the results of investigation are likely to have effects which can be applied by physicians all over the world to innumerable patients through unlimited time. Just so far as possible, therefore, medical schools have the duty of acquiring new knowledge quite as much as they have the task of teaching knowledge already acquired. Not all medical schools have recognized this obligation for double service, but those schools that have done so and are contributing to medical progress already stand confessedly out from and above those that do not. This is apparently destined to be so more and more; and, unless the purely teaching schools extend their activities, an undesirable class distinction is sure to arise; and the schools that do not encourage and even go farther and insist on research will become known as lower grade schools, and sooner or later their existence will be imperiled.

We thus come logically to the conclusions that the medical schools of the future must perform both teaching and investigating functions, and that this applies to all schools. It is idle to deny that research, like teaching, is dependent not only on men, but also on money, and that, given the men, that school which is the better equipped financially will be able to perform the more research. But quantity is here a matter of little moment. The mere fact that it cannot do as much need not deter the small school from doing what it is able to do. The great discovery often comes from the humble laboratory.

PRESENT EXTENT OF RESEARCH IN MEDICAL SCHOOLS

Within the better medical schools at present there may be found various classes of persons engaged in investigation. Almost invariably some of them are members of the regular academic staff, and more are engaged also partly in teaching, but a few have purely research positions, giving their whole time to research. Then there may be postgraduate students, some of whom are working for the higher academic degrees of master of arts and doctor of philosophy; there may be those who are primarily practitioners of medicine, but who give a portion of their time to investigative work; and in smaller number there are often found undergraduate medical students who are impelled by one motive or another to undertake the investigation of minor problems that are of immediate interest to them. The existence of such varied groups and the necessity of providing for all of them raises the question as to the means by which within the schools research may best be encouraged and promoted.

RESEARCH BY PRACTITIONERS OF MEDICINE

We do not need to dwell here on the matter of research by postgraduate students, or by those who are primarily practitioners of medicine and not university officers. More and more are the departments of our medical schools being sought by students who are preparing for purely scientific careers, and we must be prepared to carry such students on to the higher academic degrees. Much honor is due those practitioners here and there who do not allow their ambitions to be quenched by the demands of routine practice. In the history of medicine their contributions often stand out as shining marks of progress. Edward Jenner was a country practitioner when he studied the relation of cowpox to smallpox and made his first vaccination. Ephraim McDowell was a practitioner when he performed his first ovariotomy. Even the busy army medical officer occasionally finds time to make notable contributions to medicine, as did William Beaumont when he made his immortal observations on gastric digestion, and Reed, Carroll and Lazear, who laid bare the method of transmission of yellow fever and opened the way for its elimination. Medical literature is constantly receiving valuable accessions from practitioners who are at the same time investigators. With the increasing complexity in technical methods and the increasing demands for apparatus of precision, much of it expensive, those practitioners who are seriously ambitious to investigate will seek the university laboratories and the university hospitals more and more, and, if they are capable men, the laboratories and the hospitals should always be open to them.

MORE RESEARCH WITH LARGER NUMBER OF FULL-TIME TEACHERS

In the gradual elevation of the standard of medical schools it has come about that research is expected more and more of members of the regular academic staff. This can only be commended. The ability and the disposition to investigate should, indeed, be regarded as an important sine qua non of appointment to an academic position, and not only of appointment but also of subsequent maintenance of the position. It should be clearly understood that no holder of such a position is performing his full duty to his school unless he investigates. This is being generally recognized by the best schools in the medical sciences, but it is as true of the clinical as of the preclinical studies. That in this respect there still remains a distinction between the two groups of studies is due to the fact that the evolution of clinicians and of clinical departments from their traditional position as exclusively teaching factors of the schools has been slower than evolution in the preclinical departments. Such a distinction is wholly artificial and is destined to pass away as we get farther removed from our early notions regarding the place which the schools should occupy in medical science.

The establishment of full-time chairs, already achieved in the preclinical and greatly to be desired in the clinical branches, will help to break down this distinction and, moreover, will help to free the schools from every suggestion of commercialism. The great obstacles will be, as they have been in the past, two types of individuals, of whom our schools possess far too many, who give only a part of their time to the school work, who are not investigators, and who possess little appreciation of investigation and little taste for it.

One of these is the clinician who has acquired a practice that is materially too successful and allows it to command him, while at the same time he endeavors to hold a responsible position of leadership as the head of a department in the school. Although not an investigator himself, he may, indeed, perceive the signs of the times and endeavor to satisfy a sensitive conscience through investigation by his assistants, forgetful of the ethical principle that no man can ever do his full duty vicariously. Rarely, however, is his vision so clear as this, and in his position of depart-

mental leadership he may exert a baneful influence in two directions: first, on his departmental staff by virtually discouraging research, and, secondly, on his students by introducing into their receptive minds wholly wrong ideals of the work of the practitioner.

The other obstacle is the subordinate instructor who is struggling to acquire a practice and who holds his school position for its salary, or in the belief that a connection with the school will be of future material benefit to him, or because he is thus enabled to continue his training in his special branch, and who does not realize that the performance of worthy research offers the strongest recommendation for his future advancement. We are too prone to put the intimate, elementary instruction of medical students into such hands.

Investigation by the staff, from the heads of departments down, should be prominent throughout the whole school and should set the standard for the school's activities. Investigation tinges the teaching itself. Welch has aptly said:

> The power of imparting knowledge, gained second hand, fluently and even skilfully, is not an uncommon gift and is possessed by many who have never engaged in research and have no especial inclination or aptitude for it; but the teaching of him who has questioned Nature and received her answers has often, and I think commonly, in spite it may be of defects of delivery, a rarer and more inspiring quality.

RESEARCH SPIRIT SHOULD PERMEATE MEDICAL SCHOOL

The question may here be raised whether and in how far it is advisable for medical schools to establish separate chairs and separate departments for research only. That there is a tendency among universities to establish research chairs in both medical and other schools is evident, and there are notable instances in which independent departments of research have been instituted with successful results. Such independent chairs or departments may be unlimited in the scope of their researches; or, either because of the terms of the gifts of funds which have enabled them to come into being or because of the tastes of their occupants, they may devote their energies to certain specific topics. So far as they supplement and work in cooperation with other research activities of the school, they are to be commended and their multiplication is to be welcomed. But so far as they assume the sole research functions of the school and afford an excuse for other chairs or departments to refrain from such activities, they can offer only an imperfect, inadequate and, it may be, even harmful substitute for better conditions. The conditions can be ideal only when the whole school is permeated by the spirit of research, when this spirit characterizes all departments, whether preclinical or clinical.

ARGUMENTS FOR RESEARCH BY UNDERGRADUATES

Investigation by undergraduates has been encouraged in the past more in Germany than in other countries, and the inaugural dissertations that are required of all prospective graduates of the German universities represent an appreciable contribution to the sum of human knowledge. In medical history there are striking instances in which subsequent leaders have begun their life work as undergraduate students, a notable case being that of Ehrlich, who was a student at Breslau when he first studied the dyestuffs and thus laid the foundation for his later work on tissue affinities and chemotherapy.

How far is it desirable to encourage the spirit and the performance of research by undergraduates, and by what means may it best be accomplished? Students on entering the medical school are usually regarded as so much raw material which, under the tuition of school and hospital, is to be worked over and fashioned into doctors of medicine, who are then sent out into the world to pursue their careers, the most of them as practitioners, a few as investigators, teachers or administrators, while still fewer will combine two or more of these activities. They come to the school with various mental equipments, inclinations and capacities. Some are already filled with the spirit of modern science, enthusiastic to learn of its achievements and eager to follow its allurements. Others know little of it and have never heard its inspiring call. The school has a great opportunity, an opportunity to mold the student mind and determine its attitude toward medicine throughout all later life.

Shall the practitioner follow the static or the dynamic path?

The static mind in medical practice is satisfied to utilize what is already tried and accepted. It becomes habituated to a routine. If the patient possesses certain symptoms he has a certain specific disease; if he has a specific disease he is to be treated in a specific manner. If, therefore, a physician of this type can once get his patient properly labeled, the routine is started. The static mind in medical practice is like the botanist or zoologist who searches for species; it is like the academician in painting who follows established rules. An exceptional symptom is an anomaly, a thing to be neglected because it does not fit into the preestablished scheme. Resemblances, not differences interest him. In surgery, the static mind is often an attribute of the brilliant operator whose technic is the envy of his younger colleagues and is measured by the number of minutes in which he is able to perform a given operation. The static mind is not averse to learning new methods and new points of view, provided they have once been pointed out by others; but, once acquired, the new becomes again the conventional and a new routine replaces the old.

GREATER PROGRESSIVENESS OF THE INVESTIGATIVE MIND

To the dynamic mind in medical practice, on the other hand, a disease is not primarily and solely a pathologic entity, but an indication of a deranged complex physiologic mechanism, and it requires the most careful observation and analysis. Each new case of a disease is not simply the replica of previous cases, but presents a problem for investigation, a new topic for research. A different symptom is a thing of interest, which is to be referred back to its physiologic basis and may alter the course of treatment fundamentally. The dynamic mind is never closed; it is constantly looking for new points of view and new methods of diagnosis, of prevention and of treatment; it is the progressive mind, the mind that recognizes medicine, not as an art, but as a science, one that is actively in the making and demands contributions from all of its followers.

Of these two lines of thought and practice unquestionably that of the investigator means more for medical progress and more for the benefit of mankind. It is that which every practitioner ought to follow, and it is that which every practitioner can follow in greater or less degree. Whether or not he shall follow it depends probably in most cases on the influence which he has received from his medical school. Is it a

school which is permeated with the spirit of research? Are the facts and principles presented to the student as finalities or as steps on the way toward something better, something toward the gaining of which he himself may contribute? Furthermore, is he encouraged, or even allowed, to undertake investigation during his undergraduate days?

INCREASING OPPORTUNITIES FOR UNDERGRADUATE RESEARCH

Here we find that the practice of our American medical schools varies greatly. As the result of a questionnaire conducted by Dr. Cecil K. Drinker five years ago it was found that of twenty-five selected schools of different grades, but including the foremost schools in the United States and Canada, seventeen allowed their undergraduates to undertake research in conjunction with their regular medical work; but of these only nine aided it by a concession of hours in the regular roster. It is doubtful whether any others of the 120 schools then existing offered a similar privilege, and hence the percentage of American schools favoring undergraduate research in 1912 would probably not have been over 7.5. This number has probably increased slightly within the past five years, since there is a growing tendency among the better schools to introduce elective work, a part of which may be devoted to research. Thus, although a distinct change in the condition would probably appear if the schools of today were compared with those of twenty-five years ago, the encouragement of undergraduate research is still small.

UNDERGRADUATE RESEARCH TO BE ENCOURAGED, NOT REQUIRED

That there should be undergraduate opportunity to investigate is hardly open to question. Deliberately to close the laboratories and hospitals to those students who desire to go beyond existing knowledge cannot be considered. At the opposite extreme and equally inadvisable may be placed the forcing of research on all. That research, however, should be constantly kept before the student as his ideal hardly admits of discussion. This can be done only when the spirit of research permeates all medical teaching, from the student's entrance to his graduation. There is perhaps no science in which less can be taken for granted than in the science of medicine. No topic here can be regarded as a closed chapter. In the teaching of such a rapidly growing science there is no place for ex cathedra statements, or for appealing to supreme authority, whether of doctrine, person or fact, for doctrine and person and fact are frequently dethroned. Such teaching can exert only a pernicious, deadening influence on the pupil's mind; it imposes on his mental processes shackles which can be broken later only with difficulty. The attempt to turn out a finished product, a young doctor crammed to the utmost with existing knowledge and a familarity with existing methods of diagnosis and treatment, is fatuous. In a few more years the finished product will be behind the times and much of his knowledge will be useless. The student should be taught to have, not indeed a captious, but a wholesome, hesitation to accept authority blindly. He should be led to seek the conditions of discovery. He should be equipped with the means of progressing after his student days are over. There is no single way to accomplish this more surely than by encouraging him to undertake before he leaves the school some piece of original investigation.

RESEARCH AND THE OVERCROWDED CURRICULUM

The objection will here be raised that with the enormous mass of material now to be learned and the already excessively crowded curriculum there is no time for the student to do anything outside of his routine studies. Here a glance at the origin of the present curriculum may be of value. When the addition of a fourth year to the former three years' course was contemplated it was believed by the leaders in medical education that the student would be given opportunities for research. But the demands, partly for laboratory work in the preclinical subjects, and chiefly for more routine clinical work, were too great to be resisted, and the added time was parceled out among the departments of the school and devoted to more routine work. From time to time still further routine work has been added, also chiefly clinical, until we have the present 4,000 hours of prescribed work, with many schools going beyond this amount, and all schools overburdening their pupils.

Although this condition rests on the plausible contention that the enormous volume of present-day medicine requires the present crowded curriculum, it is, nevertheless, contrary to rational ideas regarding educational methods. The present four years' curriculum requires a stuffing of the student's mind, with all too little time for mental digestion. It should be critically and impartially reexamined with a view to the judicious omission of unnecessary matter. The undergraduate ought not to be expected to acquire pronounced technical skill.

We must give up, too, the idea that we can train the specialist during his undergraduate life. We do not even attempt this with the student who is to be an anatomist, a physiologist, a pathologist, a bacteriologist or a pharmacologist; we should not attempt it for the future ophthalmologist, otologist, laryngologist, neurologist, obstetrician or even the operative surgeon. All these must acquire their special training during their postgraduate years. It must soon be recognized that only the fundamentals should be taught the undergraduate, and the curriculum must be made to include only the fundamentals.

A fifth year appears now to be a practical certainty, soon to be realized by all schools. Here a warning should be raised. Unless those who favor undergraduate research assert themselves there is a danger that this new year will meet the same fate as its predecessor. Every attempt to devote it to routine hospital duties or parcel it merely into additional routine instruction of any kind should be resisted. There is every reason to believe that with the curriculum organized rationally, time can be found for many undergraduates to test their powers as investigators.

RESPONSIBILITY OF MEDICAL SCHOOLS

In the gradual evolution of medical schools from humble beginnings we have not yet come fully to realize how great is the part that they may play. They should be the supreme leaders in medical science. They should know its history and be wise in conserving the best and most worthy of its traditions. They should be the chief exponents of the medicine of the day and the teachers of its future disciples. They should be foremost in making the medicine of the morrow and in training its future discoverers. They can do all of these things if they will. It is for them to decide whether or not they shall rise to the full dignity of leadership.

THE BACTERIOLOGY OF FOODS*

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While the bacterial examination of water in this country has led for some years past to fairly uniform results and has given information of the highest value for estimating the sanitary quality of a water, the bacterial examination of foods and its interpretation have been followed in many cases by a conflict of competent opinion and by a confusion of official and semiofficial rulings that have caused some bewilderment. A brief survey of the situation may be useful in drawing attention to certain points at issue.

It will be recognized that the value of bacterial food examination has definite limits. Actual discovery of pathogenic bacteria in food is a rare occurrence, and in particular cases may have little or no practical significance. Few workers would think of advocating a routine bacterial examination for the purpose of ascertaining whether or not specific articles of food can safely be eaten. Milk, the food most frequently subjected to bacterial examination, is never, so far as I know, examined with the view of determining the presence or absence of disease germs before it is consumed. To most bacteriologists there is no need to dwell on the futility of such an attempt.

It is true that in certain instances in which food poisoning due to bacteria or their products has occurred, pathogenic bacteria have been found in the remnants of the food after the event; but at most such findings afford some degree of corroboration, and oftentimes do not greatly strengthen the evidence connecting the outbreak of poisoning with a particular food. Infections due to milk are traced to their origin almost altogether through use of epidemiologic data, and as, for example, in most milk-borne typhoid outbreaks, the finding of a specific germ in the food itself, even if possible, would add little, if at all, to the weight of the evidence. It is not likely that the occasional cases of meat poisoning due to *B. enteritidis* and its allies could be materially diminished by any practicable system of bacterial meat examination.

Direct preliminary examinations of food being, therefore, of little or no value, there remains the method of attempting to estimate the possibilities — not actualities — of danger on the basis of bacterial findings. This method has been applied especially in the case of milk, oysters and a few other foods, and its use has been apt to lead to the adoption of standards of bacterial purity which serve to condemn or approve. It is precisely this subject of standards that has given rise to sharp controversy and has been surrounded with much misunderstanding.

Although the fixing and interpretation of standards has been much discussed in connection with water analysis, there is still some difference of opinion, tacit or expressed, as to what shall constitute a standard and what standards are for, anyway. The significance of a standard weight or standard measure can be generally appreciated even by those without technical training, but not so that of a standard of interpretation. The earlier chemical understanding of a "standard of purity" is still current, and it is a common conception that bacteriologists test food or drink to determine the presence therein of definite harmful bodies as the chemist tests for arsenic or lead. This is doubtless partly due to the feeling that all bacteria are harmful and that the fewer bacteria in milk or water the safer or more wholesome are these substances. This belief also colors the acceptation by laymen of bacteriologic opinion and their interpretation of bacteriologic data, as when Albert Shaw[1] construes the bacterial limit proposed for filtered water by the German health authorities as "a warning to the municipal governments of the country not to supply their citizens with a drinking water containing more than 100 cholera germs to the cubic centimeter," and adds, "It was considered that water infected to no greater extent could be used without serious danger."

The arbitrary adoption of a standard yard, pound or bushel is largely for the purpose of protecting the community against fraud, and this is true to only a slightly less degree of such measures as the fixing of a standard for the butter fat and total solids in milk. Nearly all chemical food standards fall in this category. It is evident, however, that bacterial standards for water, milk and foods in general are of a completely different character. Such standards merely express the expert opinion of one or, more commonly, of a group of persons that indications of sanitary unwholesomeness are afforded by the presence of a certain number or kind of bacteria. The history of science is full of illustrations of the danger of applying too rigorously or too mechanically any such standards of interpretation. One of the most familiar of these is the famous case of the chemical standards for drinking water. The value of the chemical examination of a water as a guide to its sanitary quality is now admitted to be very slight; some sanitarians would deny it altogether. And yet for years an enormous amount of energy was expended on making chemical analyses of water and ingeniously interpreting the results, usually on the basis of shrewd observation of the water sources. There is no doubt that the strict application of such chemical standards led frequently to the condemnation of perfectly wholesome water and sometimes to the sanction of potentially dangerous supplies.

While these facts respecting the tentative and fallible character of standards of interpretation are generally familiar to all scientific workers, it is well known that an open avowal of this situation is not always satisfactory to public officials and others who have decisions to make. Judge and jury would prefer the assurance that the thing is wholesome or unwholesome rather than the opinion of the witness that it may be so. It is all the more desirable to make clear to the public the fact that all bacterial standards of interpretation are but the expression of a more or less general consensus of opinion and are not claimed by any competent worker to be final or absolute. It is universally found that all standards of interpretation as soon as they are adopted must face so-called exceptions in which experience is at variance with the rigid application of the standard and overweighs the latter. Take, for instance, the standard prepared by the commission appointed by the Treasury Department to recommend standards of purity for drinking water supplied to the public by common carriers in interstate commerce.[2] The numerical limit proposed (100 colonies per cubic centimeter developing in twenty-four

* Chairman's address, read before the Section on Sanitary Bacteriology of the Society of American Bacteriologists, Dec. 29, 1916.

1. Shaw, Albert: Municipal Government in Continental Europe, p. 398.
2. Reprint 232, Public Health Reports, Nov. 6, 1914.

hours at 37 C.) is, as such standards generally are, the result of a compromise; it should have been somewhat higher in the opinion of some members of the commission, lower in that of others; others still would have omitted a colony count standard altogether. In point of fact, however useful the numerical limit may be in affording leverage for an expert opinion, it can hardly be maintained to be valid as an absolute criterion. In several instances I have found that deep well waters stored at a low temperature give a high 37 degree colony count in a few days. One such water giving no gas in 100 c.c., developed only twenty-eight colonies per cubic centimeter at 37 C.; but when stored for five days in a clean glass vessel at 10 C., developed 12,300 colonies. It is difficult to believe that any real change in the wholesomeness of the water occurs in such cases.

When the exhaustively studied and relatively simple water standards are subject to such exceptions and reservations, it is certainly not to be expected that bacterial standards for food will be any more satisfactory. The curious state of affairs with reference to bacterial criteria for the purity of milk exemplifies the uncertainty that actually exists. An "excessive number" of bacteria in milk seems to signify to some workers a number of over 200,000 per cubic centimeter, to others, over 1,500,000, and to some perhaps any counts that run above 10,000. The accuracy of the methods of milk examination current in recent years does not strengthen the case for arbitrary judgment. Many attempts have been made to standardize the methods of bacterial milk examination, and yet in the cooperative investigation conducted by four large New York laboratories and reported by Professor Conn, it was found that the final report on one and the same sample of milk — to select one case — might vary as much as from 30,000 by one laboratory to 2,410,000 by another.[3]

Apart from such difficulties, which are due to divergence in laboratory practice and can be in part although probably not altogether overcome, there is the question that already has given rise to much discussion, namely, the interpretation to be placed on consistently high bacterial counts in milk, numbers, let us say, ranging by the ordinary plate method quite uniformly above 200,000. It seems now to be established that the number of bacteria in market milk depends chiefly (*a*) on the initial contamination from the cow and from unsterile utensils, and (*b*) on the bacterial growth occurring between the collection and delivery of the milk. These two sets of factors are often summed up by saying that large bacterial numbers indicate that the milk is either dirty or stale or both. The use of words with offensive connotations is probably not without some justification, but should not be allowed to affect too much the judgment which experienced workers accord to the facts.

As regards numbers due to initial seeding, it is plain that the general cleanliness of the cow may conceivably be a matter for sanitary as well as esthetic consideration. There is less likelihood that dangerous bacteria will get into the milk from a clean animal than from one slovenly kept. Just how important a safeguard against infection this sort of cleanliness is cannot be even approximately estimated. It is unquestionably far less valuable than attention paid to the animal's health. As has been demonstrated many times, a clean but diseased cow is more dangerous than an ill kept healthy one. It must not be forgotten, however, that clean and orderly methods react favorably on the morale of the industry, and their practice unquestionably stimulates interest in the far more significant matter of the health of the animals and of the employees.

The other main source in the initial seeding, the bacteria derived from apparatus and utensils, is of less sanitary importance. Pease[4] has shown how a large amount of bacterial multiplication may occur in milk cans even after "reasonably efficient, obvious and bacterial cleaning." In view of what is known of the conditions necessary for the multiplication of pathogenic bacteria, it is difficult to believe that these cans are to be properly considered as "breeding places of disease germs." We must admit that bacteria from utensils that have been thoroughly cleaned but not sterilized are not likely to belong to dangerous varieties, although their presence in large numbers may impair the keeping qualities of the milk, and so be of commercial importance. In point of fact, the treatment that milk and other foods get in the ordinary well conducted household is likely to add many bacteria of the same general character as those under discussion. To call milk "dirty" if the number of bacteria exceeds 10,000 or 200,000, or what not, is to substitute rhetoric for scientific precision.

The second factor in producing high bacterial counts in milk is the time for which, and the temperature at which, the milk is held. There is no need to rehearse the numerous experiments that have been made showing the rapid rate of bacterial propagation at high temperature and the slackening produced in this rate by chilling. Milk at the start relatively poor in bacteria may, if not cooled, develop as many bacteria in a few hours as another lot kept at low temperature will in several days. Regardless of the time elapsing since collection, milk containing many bacteria is sometimes said to be stale, or if few, to be fresh.

The real question here of course concerns the effect of bacterial multiplication in milk and its sanitary bearing. If certain kinds of pathogenic bacteria enter milk at the time of, or soon after, collection, there is evidence that they multiply and so increase the chances of serious infection. Possibly this danger is somewhat lessened if they do not enter until after the multiplication of the ordinary milk bacteria has passed into the hundred thousands; but we possess little certain information on this point. Since in the great majority of cases pathogenic bacteria are not present or cannot be demonstrated, the problem more commonly discussed is whether the products of ordinary bacterial multiplication are in themselves harmful. In some instances the use of old milk has been thought to be connected with the production of acidosis in children who were not well nourished or who had suffered previously from gastro-intestinal disturbance.[5] It cannot be assumed offhand that all bacterial products are injurious; some may increase the palatability and possibly the digestibility of food substances. Milk intentionally seeded with *B. bulgaricus* has been used acceptably and in the experience of some physicians beneficially by invalids and persons in delicate health. It is yet uncertain whether the products of *B. coli* or other organisms present in the healthy mammalian alimentary tract are not highly beneficial if not essential to normal digestion. So far as the bacterial products in

3. Conn, H. W.: Reprint 295, Public Health Reports, Aug. 13, 1915.

4. Pease: Am. Jour. Pub. Health, 1916, **6**, 563.

5. Chapin, H. D., and Pease, M. C.: Acidosis of Gastro-Intestinal Origin, THE JOURNAL A. M. A., Nov. 4, 1916, p. 1351.

milk are concerned, we cannot be positive that a given sample of milk containing 200,000 or 2,000,000 bacteria as determined by the ordinary colony count and about which nothing else is known is any more or any less likely to produce injury than one containing only 10,000.

With respect to the living micro-organisms themselves the situation is much the same. It might be argued that if 200,000 bacteria per cubic centimeter are present, there is a greater likelihood that some of them are dangerous than if there are only 10,000; but that this is not conclusive is shown by the fact that the multiplication of saprophytes is held by some to be an obstacle to the growth or the continued existence of pathogens. Large numbers of milk bacteria, irrespective of kind, in themselves and without reference to their sanitary implications, have never been shown to be definitely injurious.

In brief, bacteria in market milk may owe their origin either to a diseased or healthy cow, a diseased or healthy human being, unsterile apparatus or utensils, or to multiplication — which may have been either rapid or slow — of an initially large or initially small number. It is obvious that the sanitary importance of these several sources is very different and that the ordinary colony count affords no means of distinguishing between them.

In consequence of the uncertainty often attaching to the interpretation of the colony count, numerous attempts have been made to find specific bacteria whose presence in milk would determine more definitely whether the milk was "bad" or "good." As is well known to workers in dairy bacteriology, these attempts have not been successful, and no organism has been found the relative abundance of which in milk is considered to throw light on the character and sanitary history of the milk in the way in which *B. coli* has proved useful in water examinations. The search for such organisms, however, has not been altogether abandoned.[6]

Evidently the most that can be claimed for the bacterial examination of milk is that it offers indications more or less precise of possibilities of danger. It cannot often enable us to declare positively that a particular lot of milk — I am speaking here of raw milk — is safe to use. A milk with a relatively low bacterial content has been known in more than one instance to give rise to epidemic infection, as in the extensive Boston outbreak of septic sore throat in 1911, when the responsible milk gave counts below 10,000 in fully half the samples examined throughout the months when the epidemic occurred.[7]

In general, the interpretation of results would be facilitated by a closer coordination between the laboratory work and the dairy inspection. High numbers — again let us say numbers above 200,000 — may perhaps arouse suspicion as to the general care taken in collecting and handling the milk; but the source of the suspected trouble and the degree of danger to the public health can be arrived at only by the aid of dairy inspection. On the other hand, inspection may uncover sources of danger of which the bacterial examination gives no hint. More important than either dairy inspection or bacterial examination as a means of preventing the dissemination of infection by milk is the control of the modes of procedure in the milk business. Particularly important as concerns the use of raw milk is the strictness of supervision exercised over the health of all employees. Prevention of the infection of milk from human sources should be always a primary aim. Yet such precautions are peculiarly difficult to carry out in practice. In how many certified dairies are all employees examined for the possible presence of typhoid carriers? And what safeguard have we that a healthy milker may not, one time or another, pick up a streptococcus or diphtheria bacillus from some unsuspected source and become a carrier over night? Such familiar apprehensions point to the importance of the procedure which thus far has proved more important in checking the spread of milk-borne disease than any other measure — the practice of pasteurization. Needing, as it does, to be controlled bacterially and otherwise at every point, it nevertheless constitutes at present our chief reliance in preventing the dissemination of infection by milk.

These considerations throw perhaps some light on the real value of bacterial examinations of milk. Such examinations must be regarded as primarily useful as guides to proper procedure in handling and distributing and not as furnishing absolute criteria of wholesomeness. Even if we are safe in condemning milks containing consistently over 200,000 or 2,000,000 bacteria, we cannot endorse all milk with less than 10,000 as surely free from all possibility of conveying infection. In point of fact, our interpretation of the significance of numbers varies with our knowledge of the conditions. That different constructions must be placed on the numbers of bacteria in raw and in pasteurized milk is universally recognized. The grading of milk in small communities is on a different footing from the grading in large cities. Other circumstances also are taken into account. The New York City board of health allows its Grade B milk to contain 1,500,000 before pasteurization in the city, but only 300,000 before pasteurization in the country. The excellent use that the New York board of health makes of bacterial counts in controlling the grading of milk is typical of the trend of opinion in this matter.[8] The numbers of bacteria in milk have little meaning unless the sanitary history of the milk is known; when this is the case, they often become useful in controlling procedures and detecting possible sources of danger; they can never be used as absolute and rigid standards for condemnation or approval; they are guides to investigation; they are not, taken alone, a basis for final judgment.

The situation with respect to the bacteriology of foods other than milk has not been so exhaustively studied and is, broadly speaking, of less sanitary importance. As is well known, the share of milk in the dissemination of infection far surpasses that of

6. Attempts have been made to establish standards for the numerical abundance of B. coli in foodstuffs similar to the standards proposed for drinking water. These have not met with general acceptance for the reason that the significant conditions are quite different, one important distinction being that multiplication of the initial seeding is usual in foodstuffs, and rare or altogether absent in most waters. No evidence seems to have been brought forward that the multiplication of B. coli in foods is any more likely to be accompanied by injurious consequences than, say, the multiplication of B. subtilis. In sausages and in presumably wholesome eggs, B. coli has been found in numbers far exceeding the admissible limit for drinking water. In the one case an abundance of this organism connotates a strong possibility of the presence of disease germs; in the other case, such a possibility is highly remote. Esthetic sensibilities are sometimes appealed to, and B. coli to the uttermost generation is held up to shame as being "always of fecal origin." Whether such a way of regarding the facts is justified or not, the following out of this reasoning chemically as well as bacteriologically would involve certain difficulties. The phobia of absolute bacterial cleanliness in the derivation of foods may be cultivated to the exclusion of more essential things. It is of little use to complain that B. coli is present in a palatable egg or sausage while we leave the preparation of the food in our clubs and restaurants to possible typhoid carriers and submit to the inhalation of droplets of saliva discharged by coughing neighbors in an assembly room or street car. B. coli in water is a sanitary index; its significance in foods is dubious.

7. Winslow: Jour. Infect. Dis., 1912, **10**, 73.

8. Brown, L. P.: Am. Jour. Pub. Health, 1916, **6**, 671.

all other foods, partly because of its origin, partly because of the extra hazards to which it is exposed during collection and delivery, and partly because it is consumed soon after entering the household and often without heating. Many other foods, however, are subject to occasional invasion by pathogenic and putrefactive bacteria, and their bacteriology is of growing importance.

The flesh of cattle and of swine, especially the latter, has frequently been implicated in outbreaks of food poisoning, and there can be no doubt of the importance of safeguarding the community against meat-borne infection. In many meat-poisoning outbreaks there is convincing evidence that the offending bacteria, for the most part of the *B. paratyphosus* and *B. enteritidis* groups, were derived from a diseased animal; but in other cases infection by a human carrier engaged in preparing or serving food cannot be excluded. Practically nothing is known as to the original source and habitat of such organisms as *Bacillus paratyphosus* B and *Bacillus paratyphosus* A, or of the reason for the relatively greater rarity in some parts of the world of the latter organism in human infections. The connection of the different types of paratyphoid bacilli with hog cholera and with other diseases of food animals is quite obscure.

If we ask what relation the number of bacteria in meat bears to its liability to convey disease, we are met by the same set of difficulties experienced in interpreting the colony count in milk. Small numbers of bacteria do not necessarily connote freedom from infectivity. Zweifel[9] and others have made numerous examinations of chopped meat without bringing forward any demonstration of a relation between numbers and wholesomeness. "Standards," however, have been suggested, that of 10,000,000 per gram for hamburger steak being one of the most recent. Whether such standards in the minds of those proposing them are based on some connection conceived to exist between numbers and liability to infectivity or on the hypothesis that the presence of a certain number of bacteria betokens the accumulation of an injurious amount of decomposition products is not always clear. If the latter, then it seems to be assumed that the products formed by bacteria in meat are less harmful than those formed in milk, since the permissible bacterial limit for the latter is usually set at a much lower figure. In the present state of our knowledge, any standard established on such a basis is so conjectural as to have little practical value. The uncertainty that prevails is illustrated also by the varying interpretation placed on the number of bacteria in sausage. A limit of 2,000,000 per gram has been proposed by V. d. Slooten,[10] but Savage[11] believes that little importance can be attached to the number of bacteria present, and his opinion is shared by Cary[12] as the result of a recent study of sausages in Chicago. *B. coli* is commonly present in sausage, often in numbers ranging from several hundred to several thousand per gram. In any given case it may be impossible to determine whether a high bacterial content is due to lack of cleanliness in production or to multiplication, in the absence of preservatives, of an initially small number.

Bacterial standards again have been proposed for shell oysters, but reliance on such standards alone would be misplaced. While no one can question that the bacterial examination of oysters has afforded information of considerable value, especially with reference to seasonal conditions, there are great difficulties in the way of condemning or approving oysters on the sole basis of bacterial enumeration. If along with palatability an exemplary source and sanitary purity are assumed, the actual bacterial content at the moment of consumption is relatively negligible. When the proper method of sanitary control over the oyster industry has been worked out with the aid of bacterial examinations, attention may be safely focused on the supervision of procedure rather than on bacterial findings.

The bacteriology of eggs has been studied by Rettger,[13] Hadley[14] and others, with the outcome that as a rule the whites of normal fresh eggs are found to be sterile, but the yolks often contain bacteria. Furthermore, it is said, so long as the shells are kept clean and dry, extensive bacterial invasion seldom occurs. The soiling and moistening of the shell under ordinary conditions leads to rapid decomposition. Standardization of the individual shell egg is not attempted except by the rough physical method of candling, and the practical application of bacterial methods is confined to the examination of frozen and dried eggs. The value of such examinations as a guide to the control of the commercial industry has been finely demonstrated by the work of Miss Pennington,[15] through which marked improvements have been brought about in the methods used in the egg-breaking houses. There has been a reluctance on the part of well informed workers to set up a definite bacterial standard for eggs. There is no doubt that eggs containing many bacteria often pass the candling test and are placed on the market. Some such eggs yield no evidence of decomposition to the senses and are used for food without question. In a general way the amount of ammoniacal nitrogen as determined by the Folin method corresponds with the number of bacteria, and both agree with the organoleptic indications. Relatively large numbers of bacteria, however, may be present without other signs of decomposition,[16] and in the opinion of many workers it will continue to be difficult, if not impossible, to establish any definite relationship between colony count and wholesomeness. Miss Pennington and her co-workers state that after a comprehensive examination of different types of market eggs, "the eggs constituting the samples of July and August firsts, seconds, dirties and checks would be used without compunction by the housewife, baker or confectioner," although the bacterial content of some of these eggs was over 1,000,000 per gram, including many colon bacilli.[17] This is in accord with general experience. Eggs, although highly perishable, do not appear to have been definitely implicated in the causation of illness nearly as frequently as some other foods. This fact has been thought to indicate that for one reason or another poisonous bacterial products as well as bacteria pathogenic for man are rarely present. Rettger[18] and his associates, however, have pointed out that eggs derived from fowls with ovarian infection which harbor *B. pullorum* in large numbers in the yolk may produce abnormal conditions when fed to young rabbits and some other animals. It is not known to what extent this organism and its products

9. Zweifel: Centralbl. f. Bakteriol., Part 1, 1911, **58**, orig., 115.
10. V. d. Slooten: Abstr., Centralbl. f. Bakteriol., Part 1, 1909, **43**, ref., 193.
11. Savage: Med. Press and Circ., 1908, n. s. **86**, 167.
12. Cary: Am. Jour. Pub. Health, 1916, **6**, 124.
13. Rettger: Centralbl. f. Bakteriol., Part 2, 1913, **39**, 611.
14. Hadley: Bull. 164, Rhode Island Agric. Exper. Station, 1916.
15. Pennington: Bull. 224, U. S. Dept. Agric., April 28, 1916.
16. Bull. 51, U. S. Dept. Agric., p. 73.
17. Bull. 51, U. S. Dept. Agric., p. 70.
18. Rettger: Jour. Exper. Med., 1916, **23**, 475.

are dangerous to man. Ovarian infection of fowls is said to be very common throughout the United States, and investigators of food-poisoning outbreaks will do well to bear this situation in mind. The danger, such as it is, is of recent development, since the wide distribution of the fowl infection has occurred only in the last few years. No recent increase in number of food-poisoning cases has been remarked. Whatever may be the possibility of specific infection with *B. pullorum*, a conservative tendency with regard to the creation of numerical bacterial standards is noticeable among workers in this field. The experienced observers of the U. S. Department of Agriculture content themselves with the statement that "canned eggs with the majority of samples having counts of less than 5,000,000 bacteria per gram, and with 100,000 *B. coli* or less can be prepared in the producing section from the regular breaking stock, provided strict cleanliness and careful grading have been observed."[19] The apparent admissibility of such high numbers of bacteria in a food substance would have been eyed askance by some sanitarians a few years back, and is today perplexing to many laymen. Water with a similar bacterial content would be looked on as next door to sewage. Perhaps no clearer demonstration could be afforded of the fact already insisted on that the significance of the bacterial examination of foodstuffs lies in its use as a guide to procedure, not in the disclosure of a specific danger.

Considered broadly, the present value of the bacteriologic examination of a food depends largely on the nature of the food and on the information that has been previously obtained regarding the conditions of production and distribution. Uncleanliness and carelessness in handling, and neglect of proper preservative methods lead as a rule to an increase in the number of bacteria. To the extent to which these factors favor opportunities for specific infection to that extent do numbers afford some indication of unwholesomeness. According to the available evidence, however, derivation of food material from an ailing animal or contact with a diseased human being is far more crucial from the sanitary point of view than simple uncleanliness. Mere enumeration of bacteria throws little light on the real possibilities of danger. Bacterial examination may be quite superfluous. When one sees a swarm of flies alighting indiscriminately on bread, meat, fruit and all kinds of organic matter, a bacterial examination is not necessary to demonstrate the undesirability of the condition.

With reference to the effects due to multiplication of bacteria in foodstuffs, more evidence is needed. The determinations of ammonia in egg products seem to indicate that any measurable degree of chemical decomposition is accompanied by a very large number of bacteria, much larger, for example, than the number ordinarily held permissible in milk. The Chinese preserved egg known as pidan shows a very large amount of ammoniacal nitrogen, and there is no doubt that marked decomposition of the egg protein has taken place.[20] This decomposed egg substance is eaten freely in China, and its common use is not known to be followed by any ill effects. In view of the apparent innocuousness of the bacterial products in some foods, such as cheese, butter and sour milk, which are consumed without being heated, it is perhaps hasty to assume that all indications of bacterial activity should be stigmatized as attesting the presence of "ptomains" or the "poisonous products of decomposition." On the other hand, it has never been demonstrated that the products of bacterial growth in protein foods may not be insidiously injurious. The truth is that a great many foods technically more or less decomposed by bacterial growth are habitually eaten without apparent harm. We simply do not know at what point the products of bacterial growth become hurtful, or even what effect is caused by the growth of specific kinds of bacteria. Are most of the products of bacterial growth in foods physiologically indifferent in the quantities in which they are ordinarily consumed, and when injurious products are present, are they due to rare accidental contamination, or do all bacteria growing in milk, meat or eggs generate noxious substances which can inflict damage on the human organism, albeit such danger is not immediately recognized? Such questions cannot be satisfactorily answered at the present time, and need but to be asked to make clear the limitations of our present knowledge and the necessity of further investigation.

On the practical side it seems desirable that recommended procedures, standards and the like should keep pace with our advance in knowledge, not outrun it. In the dairy industry great stress has often been laid on barn conditions, and dairy farmers in some parts of the country have been forced to expend large sums of money on the assumption that specified barn conditions are essential to the sanitary production of milk. It is somewhat disconcerting to find that the most recent dairy studies indicate that "the condition of the barn and its surroundings exert practically no influence" on the bacterial milk counts.[21] No surer method of undermining public confidence and generating a reaction against sanitary measures can be found than the enforcement of regulations that are shown in a few years to have been unjustifiable and that must be rescinded. Confidence in "experts" and in "science" itself is shaken, and it becomes more difficult to carry out measures on which we are all agreed. We are sometimes forced to act on the basis of what knowledge we have, although it is notoriously insufficient, but we can avoid being dogmatic and extreme. Our so-called standards are often nothing but working guides for the experienced bacteriologist, and but ill adapted for crystallization in official regulations, where enforcement rests in the hands of the technically uninformed.

Since the bacteriology of foods presents today many unsolved problems, both of fact and of interpretation, it is clear that further investigations in this field will be of practical service in protecting against food infection, in encouraging cleanliness and common sanitary decency, in preventing economic waste by decomposition and by the condemnation of wholesome food on technical grounds, and perhaps in safeguarding the public health against dangers not now realized.

19. Bull. 224, U. S. Dept. Agric., p. 21.
20. Jour. Biol. Chem., 1916, **28**, 125.
21. Harding: Am. Jour. Pub. Health, 1916, **6**, 562.

What it Costs to Educate a Physician at Columbia University.—Dr. Walter Mendelson, president of the Physicians and Surgeons Alumni Association, in his annual report, states that the total cost of each student's education in the medical department of the university is $3,000. Of this amount the student contributes only $1 to every $2 expended by the university. He estimates that the teaching staff contributes each year between $24,000 and $30,000 toward the maintenance and expenses of the medical department of the institution.

THE RELATION BETWEEN PEDIATRICS AND GENERAL MEDICINE*

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The evolution of pediatrics into the dignity of a specialty has been of comparatively recent date. It is still in process of development. Many obstacles have been encountered in the ascent of this important branch. Some questions are yet in process of settlement. The relation between pediatrics and general medicine, and the position the former is destined to occupy will be determined largely by societies and occasions such as this. It is not necessary to dwell on the great importance of pediatrics before any medical assemblage.

The general public, professional as well as lay, however, often seems slow in recognizing relative values in the different departments of medicine. The beginnings of life certainly constitute the most favorable period for studying all the phenomena of life — normal as well as abnormal. It is here that we make a distinction between a broad and a narrow specialty. The extreme specialist by the exclusive treatment of one organ or even of several correlated parts of the human body may relieve suffering and prolong life, but here his service ends. The pediatrician likewise relieves pain and conserves life, but his efforts serve not only the individual but, in a large sense, the race as well. This is where our labors broaden out and touch life in its widest relations. It is where our specialty differs from others and, we believe, should give it a place of overmastering importance. We are working in line with Nature's most insistent efforts — the conservation and improvement of the race. We must hence be careful not to narrow our outlook or confine too rigidly the scope of our work.

Pediatrics is simply the application of the study and practice of internal medicine to one part — and that the most important period of life. Here, as in other branches of medicine, we must avoid the danger of overspecializing. When pediatrics is treated as an extreme specialty, the tendency is to detach it too much from general internal medicine, and both thereby are apt to suffer.

We see this proneness especially exemplified in those specialties occupying a narrow field in which a high degree of technical skill is required but which tend to detach one's view from a broader outlook in medicine. Perhaps this danger is best exemplified in the case of dentistry. For many years most of the efforts of its workers have been carried out in perfecting exceedingly fine and difficult mechanical problems. They did not seem to grasp the widespread ramifications that are sometimes seen in connection with diseases of the teeth. A broader outlook now discovers that certain affections of the joints and other structures may have a very close connection with undrained abscesses at the roots.

This may seem to be an exaggerated example of the narrowing effects of extreme specialism, but it must be confessed that this tendency is seen in other directions as well. With such a broad specialty as pediatrics this danger may not be so great, but still it undoubtedly exists and must be guarded against. Perhaps it is best shown in the too common treatment of infant feeding. This is often detached from the great underlying problem of nutrition, and handled apart from the laws of biology and nutrition in general. Any period of life is a part of all life, and must not be too much detached from what precedes and follows.

It is thus a mistake to carry to extremes the specialization of any branch of medicine. While there may well be specialization in technic, it should ever be kept in mind that infants, children and adults are not different species, but merely different forms or stages of a single species. If there were sharp divisions between these forms of the same individual, it might be possible for one specialist to take hold where the other left off. But there are no such divisions. The life history of every individual consists of a gradual developing process that extends over a long period of years, a process in which the building up eventuates in reproduction and a later period of gradual disintegration.

In the earliest stages of life, building up is extremely rapid, and in the last stages disintegration is also rapid. Toward the crest of a life curve, movement in either direction is slow. Life processes are always continuous. The changes that take place during the life cycle are not basic but secondary, a gradual change in form being accompanied by a gradual change of function. The following quotation from Dr. Abraham Jacobi[1] puts this thought in a concrete manner:

> I am quite sure that the pediatrist cannot succeed in his practical work without being a close student of nosology in general, and on the other hand, that the internist, the general practitioner and physician does not, without being at the same time a pediatrist, reach a standard by which he may be of real use either at the individual bedside or as a sanitarian in the councils of the nation. The world is entitled to demand of every one of us a complete knowledge of and profound interest in the physical life both of the young and the old.

In the great problems of nutrition, the continuity of life in all its forms and periods stands out most prominently. Both before and after birth, it is the overmastering question, as nutrition means everything at the beginning of life. It concerns growth — which means creation as well as operation.

The chemical basis of life is the same at all stages of the life cycle. The same fundamental food materials are used by the embryo, the infant, the child, the adult and the aged. The form of the food materials may not be the same at all stages of life, for change in form of the food goes hand in hand in some instances with a change of form and structure in the individual. Milk is a striking example of this fact. Here is a liquid food which turns into a solid under the action of the stomach secretions, the degree of solidity keeping up with the capacity of the stomach to utilize food of increasing density. The casein of milk has a developmental as well as a nutritional function which has been brought out by a study of the biology of nutrition in connection with the various milks.

The essential unity of the nutrition problem stands out clearly when one sees the same form of food being utilized by every form of life from the single cell individual to man in the period of the infant, the adult and the aged, despite their difference in form, structure and method of performing vital functions. In the management of infants, nutrition is the most important factor, for the building up process depends on proper nutrition, and any serious mistakes here are apt to show lasting effects.

* Address delivered at Philadelphia, Dec. 12, 1916, at the twentieth anniversary meeting of the Philadelphia Pediatric Society.

1. Jacobi, Abraham: Introduction to Nascher's Geriatics.

The finest possible training for the general practitioner and specialist can be procured by paying full attention to the problems of infant care and nutrition. Here the physician must depend on his own powers of observation, for the infant cannot tell him anything. It is almost like a laboratory training.

The chemical processes of nutrition in the adult are the same as in the infant, and if they were better understood it would not be difficult for the same physician to manage this problem with either infant or adult. As long as the stress is laid on matters of form and technic in nutrition, so long will it be necessary to specialize in this direction. The remedy for this overspecialization is a more complete knowledge of the basic principles of general nutrition in connection with the changes of form and structure during development.

The study of disease at different eras of life is largely an investigation of the changed reactions of the body to the different infections as they occur during these periods. Thus by a change in the method of looking at diseases, the same physician might readily understand the diseases of both infants and adults. The maladies generally considered as peculiar to infants are due to the fact that the infant has not yet adapted itself to its environment. As it is attacked by one after another of the infectious diseases, it acquires an immunity which usually lasts through life. Consequently these diseases are not commonly encountered in adults.

The problem, then, might be studied under the subject of immunity and not necessarily under that of infancy. Anaphylactic shock is more often seen in early years while tolerances are being established. The recent interesting and valuable studies on acidosis and protein sensitization, and the recognition of food idiosyncrasies have been carried on with the young. We may add that immunity, if understood, is just as applicable to the adult as to children.

Some diseases, while not exclusively limited to early life, have such a preponderance at this time that the period of study and observation is largely limited to the time of growth. A rapid growth is always accompanied by instability. Pathologic development is often largely the end-product of an overstrained physiologic activity.

While the study of pediatrics in its broadest outlook reaches out into almost every field of endeavor, there are thus some phases that are peculiarly its own. It is often necessary to start with embryology and consider developmental defects and diseases of the fetus itself in order to understand fully conditions that may ensue after birth.

Of the three great critical periods of life — birth, adolescence and beginning old age — the first is the most important. Accidents at this time, especially the brief asphyxia intervening in the change from the placental to the systemic circulation, may cause a meningeal apoplexy that will handicap the individual through the whole of his human existence. Other accidents may occur at this time that may either have only a temporary effect or disastrously cripple the whole life. The great phenomenon of the first entrance into life must always be investigated and considered by one who would understand certain conditions that may later unfold themselves.

Diseases of the newly born and of the early years, infant feeding, the exanthems, diphtheria and pertussis come, of course, within the special sphere of the pediatrician.

Young protoplasm is highly irritable, and actively reacts to all stimuli; hence the predominant rôle played by infections of all kinds. Symptomatology of many diseases appearing also at later periods of life is often specially differentiated in the young. Pneumonia, pleurisy and empyema, appendicitis and tuberculosis may be mentioned in this connection. In the latter disease, as is well known, the lymph glands, bones, joints or peritoneum may bear the brunt of the infection instead of the lungs, as in the adult.

While tuberculosis is a disease of all ages, its ravages are peculiar and widespread at the beginning of life. Children contribute a large share of the awful record of one seventh of all the deaths in the world. In order to treat this disease successfully, early recognition, before much destruction of tissue has taken place, is imperative. Early diagnosis means a successful cure in a large proportion of cases. Humpbacked children from tuberculosis of the spine, and permanent lameness from hip joint disease are rapidly becoming misfortunes of the past. Not only the way in which the tubercle bacilli act in various tissues, but also the methods of their transmission are now known, owing to animal experimentation and the study of the disease in children. A knowledge of its possible spread by meat and milk has led to the careful inspection of carcasses and an improvement and cleaning up of the milk supply in large areas of country by medical commissions and municipalities.

The whole tuberculosis crusade, in which children are so largely the direct beneficiaries, cannot fail to have a benign effect in later life as well, as many now believe that most adult tuberculosis has had its beginnings from a focus of infection starting in the infant or young child. As a result of modern study and treatment, in a period of twenty years, the death rate from tuberculosis in New York was reduced approximately 40 per cent., and in Boston 45 per cent. Investigations showing that tuberculosis is not inherited have removed the hopelessness that naturally went with such a belief, as regards both the child and the adult. A knowledge that this dreaded disease is often both preventable and curable — at all ages — cannot fail to stimulate renewed and successful efforts for its final elimination.

It would take too long to recall the whole list of diseases that so well repay special study during the early years of life. Rickets, the commonest developmental disease of infancy, may be particularly mentioned as warranting future study. The susceptibility of infants to bacteria, owing to their active metabolism, is shown in many kinds of sepsis, and must always concern the practitioner.

The study and treatment of actual disease is not all that concerns the pediatrician. No branch of medicine opens out into such a wide field of prevention and sociologic investigation. Nowhere does medicine touch life in such a close connection as with the child. Permanent race betterment must be accomplished entirely through the young. Infant mortality is thus a grave and pressing problem for the pediatrician. Much has already been accomplished along this line by correcting faulty diet and hygiene; but much more remains to be done. It is interesting to note that it has been the success in saving infant and child life that has led to the average prolongation of life in recent years. While largely through the efforts of individual physicians and pediatric societies the expectation of life has been increased for infancy, childhood and early adult life,

the same is unfortunately not true of middle age and later life. Many factors have entered into the accomplishment of infant preservation, but the credit belongs largely to pediatricians.

When we consider the estimation that 40 per cent. of the deaths occurring during the first year take place during the first month, and that one baby in five dies before reaching the age of 1 year, we see what a field of improvement opens out at the very beginning of life. As 88 per cent. of babies that die before the end of the first year have been bottle fed, we can see why even the ablest feeders among the pediatricians have been preaching the conservation of breast feeding.

These and other problems as to the hygienic care of infants and little children have been much aided by the establishment of child welfare organizations and milk stations in the poor and congested parts of our great cities. The same agencies are much needed in the sparsely settled regions of the country, where poverty and ignorance are just as disastrous in their effects as in the cities. It is a significant fact that in recent years the death rate of New York City has been lower than the general death rate of the state. This is due largely to the extra care given to the saving of infant life, and the city is usually ahead of the country in this respect in spite of the obstacles arising from overcrowding.

In later years, school hygiene should be regulated more by the pediatrician than by the politician. Too long sessions, cramped positions from improper chairs and desks, imperfect ventilation, poor lights and a bewildering variety of studies are all too frequently present and handicap the child during the school age. Not only health departments but school boards and even legislatures should include competent physicians in their membership. The pediatrician is needed to instruct the pedagogue in some fundamentals of child nature and growth. The latter might not fail so frequently if he had the benefit of such instruction.

Many other questions, such as the great abuse of competitive athletic contests in our schools and colleges, should be decided by educated physicians rather than by professional athletes. The various problems connected with institutional life — where children are sometimes exploited — all await a rational solution. Child labor and the working of pregnant women must concern those who are looking to the future of the race. Finally, it may here be of interest to put on record the fact that hospital social service in this country owed its first conception and successful operation to the children's division of a general hospital.[2]

One of the great services that pediatrics may render to medicine is in the field of original research. It offers today the most promising field for advanced work in scientific and experimental medicine. Fully to occupy this field, however, its followers must apply the broad methods of science at large to the solution of its problems. The best period for advanced study of disease is during the rapid evolution of the organism. The principal portals of the body are then open to infection, and the various tissues quickly react. As an example, the lymph vessels in the nasal and pharyngeal mucous membranes by their size and number quickly take up the germs that so readily attack the nerve centers and other parts of the body. No wonder that poliencephalitis, poliomyelitis, and meningococcus and tuberculous meningitis are so frequent when their active germs are abroad. Their future conquest may consist not only in a study of the life history and action of these germs but also in guarding the gateways more carefully.

We may recall in this connection that the greatest modern triumph of medical therapeutics — diphtheria antitoxin — followed the discovery of the germ and its effects as seen and studied in children. Antimeningococcus serum may now be added to the list, and future remedies will doubtless follow in other diseases from the combined researches of the pediatrician and the laboratory student. The workers in the various fields of medicine must combine and collaborate more in their efforts.

This will obviate the tendency to extreme differentiation that has detached too much the part from the whole. Partly owing to this, the various specialties have been accepted without much appreciation of their relative values. Those of fundamental importance are grouped with others having only local forms that minister to comfort and utility. It is thus right to make a sharp distinction between a major and a minor specialty. Of the former, pediatrics should take the highest place, as it deals with the formative period of life and consequently renders the most lasting service to the race.

In order to start right in this regard, medicine, as distinguished from surgery, should be handled in our universities in three great divisions: (1) pediatrics; (2) internal medicine as applied to adults, and (3) diseases of the nervous system. The threefold plan will start with the study of disease as manifested in the opening years of life, will next continue an investigation of the character of disease as seen in riper years, and finally study the great degenerations that are largely brought about by defective action of the nervous system induced principally by faulty and failing metabolism.

The minor specialties should occupy a very subsidiary space in the curriculum.

All the specialties require a thorough grounding in the underlying principles of scientific medicine. The old idea that work in any specialty should be preceded by wide experience in general medicine still holds. The quick step from the medical college to a specialty, without this previous experience, has proved disastrous, It has produced a group of skilled medical mechanics rather than broad minded physicians who can work in a specialty without detaching it too much from all relations to general medicine. Pediatrics should be one of the broadest of the specialties — it has been aptly described as the specialty of the general practitioner.

The twentieth anniversary of the founding of the Philadelphia Pediatric Society is one of the occasions that should mark an epoch in the advance of this branch of medicine. It is the glory of our profession that each medical generation hands on the torch of knowledge from age to age always with a brighter and steadier flame to illumine the dark places of ignorance and suffering. It is for the healing of the nations.

We believe that this society will make its fair contribution to the ever widening knowledge of the hidden things of life. You have the inspiration of living in this old time cradle of true Americanism and liberty. May your contributions be commensurate with your privilege. We believe in you. We look to you in the future as in the past to uphold the best traditions of our guild. We shall take pride in your achievements and shall, above all, believe that you have the will to

2. The Children's Division of the New York Post-Graduate Hospital, 1890; Forum, March, 1894; Arch. Pediat., April, 1905.

labor and achieve. May you translate vision into action and thought into deed. You can, at least, heed those familiar and inspiring lines from Addison's "Cato":

'Tis not in mortals to command success;
But we'll do more, Sempronius—we'll deserve it.

AUSCULTATORY BLOOD PRESSURE DETERMINATION

A SOURCE OF POSSIBLE ERROR *

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We desire to call attention to a phenomenon which we have noted in the course of routine blood pressure determinations by the auscultatory method. It has doubtless been observed by others, but so far as we know there is no mention of it in the literature.

It will be recalled that Korotkoff, in first describing the auscultatory method of blood pressure determinations, called attention to the fact that in lowering the pressure in the cuff from above the systolic pressure down to zero a succession of sounds was heard over the artery below the cuff. The initial sound, first audible when the cuff pressure corresponded to the systolic pressure, was of a sharp, tapping character, which, as the pressure in the cuff continued to fall, changed into a loud hum; then, still later, into a tapping sound again and finally into silence. Later observers divided this return of the tapping sound, or "third phase," into two distinct parts, a longer portion corresponding to a sharp tapping, and a shorter portion in which the sharp sound becomes suddenly soft and muffled. In a former article we offered proof of the fact that the incidence of this muffled sound or "fourth phase" marks the diastolic pressure.

Our present observation has to do with the humming or roaring sound of the second phase. In a certain number of cases of hypertension, which we estimate roughly at 5 per cent., the humming sound of the second phase is very feeble or may be replaced by a period of complete silence, so that most careful concentration on the part of the observer may fail to detect any sound. The sharp tap of the third phase sets in rather suddenly and, as the cuff pressure continues to fall, the third and fourth phases follow the usual course.

We believe that the occasional variation is of considerable practical importance, and that the unwary observer may be led into distinct error by disregarding the possibility of its occurrence. The usual technic of obtaining the systolic pressure, by the auscultatory method, is, after properly adjusting the cuff and placing the stethoscope in position, to raise the pressure quickly in the cuff, giving passing attention to the tapping sounds that are produced as the pressure ascends above the diastolic, and to stop the inflation as soon as the tapping is no longer noticed. Now in those cases in which the second phase is marked by complete silence, the inflation is very likely to be stopped at this point, the pressure being then gradually lowered and the beginning of the third phase incorrectly noted as the systolic pressure. When the blood pressure is very high, this source of error may lead the observer to recognize only a moderate hypertension. In cases of moderate hypertension, on the other hand, this point will correspond approximately to normal systolic pressure, and the error may not be suspected unless a somewhat high point for diastolic pressure puts the observer on his guard.

The means of avoiding this pitfall is plain. We always make a preliminary, approximate estimate of the systolic pressure by the palpatory method, and subsequently a more accurate determination by auscultation, being careful to raise the pressure above the point of systolic pressure as perceived by the palpating finger. In this way an error, which would often amount to as much as 50 mm. of mercury, may with certainty be avoided.

We are in doubt as to the explanation of this anomalous second phase. Its occurrence is certainly not dependent on the absolute height of the systolic pressure, but may bear some relation to the thickness of the arterial wall. In general, the more rapidly the entire estimation is made, the less apt one is to meet this period of silence. If the pressure in the cuff is raised to a point above the systolic pressure and then slowly lowered, the second phase will be replaced by a period of silence more frequently and more completely if the observer lingers about the point of systolic pressure, in an attempt to estimate the latter accurately, than if the cuff pressure is allowed to drop steadily and somewhat rapidly.

Erlanger recently suggested the following explanation of this phenomenon:

It is possible to arrange a compression chamber and stethoscope on the isolated femoral artery of the dog so that the Korotkoff sounds can be followed just as in blood pressure observations in man. If with this arrangement the artery below the stethoscope be temporarily occluded while the compressing pressure is held stationary at a level at which the sounds are in the first or second phases, it is found that the sounds became fainter and often disappear.[1] Experiments, the reports of which have not yet been published, indicate that this disappearance of sound is due to the forcing open of the lower end of the compressed artery by the blood which accumulates in the blind end. The sounds do not disappear when the artery is occluded while the third or fourth phase sounds are in evidence.

If it is permissible to assume that the hypertension in those cases in which this phenomenon is observed is the result of a high peripheral resistance, the conditions which determine the disappearance of sound in the dog would be supplied in man. During decompression, the sounds of the first phase would disappear as usual; but during the second phase, when the volume flow of blood into the lower artery becomes fairly rapid, the pressure there, owing to the high peripheral resistance, might mount to such a height as to open up the lower part of the artery within the compression chamber. The sounds might then disappear. They would reappear only when the more intense sounds of the third phase developed. This explanation finds considerable support in the fact that in these cases the period of silence is less apt to occur when the decompression is rapid than when it is slow; for it is obvious that slow decompression would favor engorgement of the peripheral artery.

* From the Department of Internal Medicine, Washington University Medical School.

1. Erlanger, Joseph: Am. Jour. Physiol., 1916, **40**, 113.

DIPHTHERIA IN A SCHOOL FOR THE DEAF AND DUMB

REPORT OF AN OUTBREAK

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Nov. 8, 1916, I was requested by the state board of health to go to Delavan, Wis., to determine what was necessary to be done in connection with a number of cases of diphtheria which had occurred in the School for the Deaf and Dumb, located there.

I found on investigation that, since the opening of school, there had been an unusual number of cases of sore throat among the pupils, but not being severe, they were all diagnosed as tonsillitis, with the exception of seven, which were in special quarantine, and under treatment for diphtheria.

In the institution there were 200 pupils, varying in age from 3 to 20 years, and fifty others, teachers and help, who either lived in the institution or came back and forth from the town daily.

The place was immediately quarantined. Schick's test, together with nose and throat cultures, was decided on. The plan was to immunize with antitoxin all who gave a positive Schick test and to isolate all who gave a positive culture to diphtheria bacilli, in either the nose or throat, until two successive cultures, taken three days apart, were negative.

RESULTS OF TESTS *

Case No.	Throat Culture		Nose Culture		Schick Test
	Diagnosis	Release	Diagnosis	Release	
57038	—	—	+	—	—
57082	+	+	—	+	+
57116	—	—	+	—	—
57136	+	—	+	+	+
57147	+	—	+	—	—
57240	+	—	+	+	—
57300	—	+	+	C	+
57302	+	—	+	—	+
57338	+	+	+	—	—
57396	+	+	+	+	+
57423	—	+	+	+	+
58712	+	+	+	+	—
57020	+	—	+	—	—
58082	+	+	—	+	—
57616	+	—	+	—	+
57286	—	—	+	—	—
57978	+	+	+	+	—
57976	—	—	+	+	—
57312	+	—	+	—	—

* In this table, + = positive; — = negative; C = contaminated.

Accordingly, 250 tests were made, and a nose and throat culture taken from each person. Of this number, 151 gave a positive reaction to Schick's test, and were, therefore, given an immunizing dose of antitoxin, while nineteen gave a positive culture for diphtheria bacilli and were isolated.

After the immunization of the nonimmunes and the isolation of those giving positive cultures, no other cases of diphtheria developed.

It has been interesting to note the relation of the nose and throat with reference to the results of the cultures, positive or negative, and to see how those giving positive cultures to diphtheria bacilli reacted to Schick's test. The accompanying table shows these results.

Of those patients giving a positive culture to diphtheria bacilli, only thirteen showed the organism in the throat, while in seventeen cases bacilli were found in the nose at the time of diagnosis; in two cases, the throat culture became negative before that of the nose.

It will be seen further that, of those who gave positive cultures, seven gave a positive and twelve a negative Schick test, thus indicating that the seven without an immunizing dose of antitoxin would soon have come down with diphtheria, and that the twelve, while being immune themselves, could pass the disease on to others.

THE PROVOCATION OF THE LUETIN TEST IN NONSYPHILITIC PATIENTS *

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AND
H. V. PARYZEK, M.D.

CLEVELAND

An exact cutaneous test for syphilis is greatly desired by syphilologists. From a practical diagnostic standpoint, an easy, exact and cheap cutaneous test for syphilis is a thing much to be hoped for.

As early as 1909, Charlet, Gautier, Favre and Nicholas had experimented with congenital syphilitic liver extract, which they termed "syphilin," and like experiments had been tried in Neisser's and Jadassohn's clinics and in several others. Fischer and Klausner, with the same idea, had also worked with "pallidin," a suspension made from pneumonia alba (the lungs of congenital syphilitics rich in *Spirochaeta pallida*).

Noguchi's report on his luetin reaction was received, therefore, with satisfaction, and the test is used quite extensively in this country and more or less abroad.

In attempting to explain its mechanism, Neisser noted that the skin of patients with late syphilis reacted not only to the luetin test but also with many other foreign bodies. On their being injected intradermally, there was a reaction much like the luetin test which Neisser termed an *Umstimmung* of their skin. Boas and Ditlevsen[2] have reported that they were able to produce the luetin reaction with gonococcal and colon bacillus suspensions in late syphilis without a gonorrheal infection or gastro-intestinal symptoms being present. They also found that with the "luetin control," which contains the culture mediums of agar-agar and ascitic fluid but no *Spirochaeta pallida*, in a series of tertiary and hereditary syphilitics, they were able to obtain nearly as many positive reactions as had been found with the luetin itself, and of almost the same intensity.

This *Umstimmung* of the skin of patients with old syphilis is not enough in itself to discredit the luetin reaction as a practical therapeutic test; but it might be found that these patients would react to some cheap substance in a way which would be of great help in diagnosis and guidance in treatment, especially if normal persons did not so react. This, however, is the especial criticism that we wish to raise. In the first place, Boas and Stürüp,[3] in 1914, working with an extract of chancroidal bubo, found that they were able to achieve Klausner's results with pallidin. Secondly, a number of workers, including ourselves, have

* From the Department of Dermatology and Syphilis of Western Reserve Medical School and Lakeside Hospital.

* This investigation was undertaken at the suggestion of the Committee on Therapeutic Research of the Council on Pharmacy and Chemistry of the American Medical Association.

1. Noguchi, Hideyo: Jour. Exper. Med., 1911, **14**, 557.
2. Boas and Ditlevsen: Arch. f. Dermat. u. Syph., 1913, **116**, 852.
3. Boas and Stürüp: Arch. f. Dermat. u. Syph., 1914, **120**, 730.

noted an occasional positive reaction in a normal person. Two delayed pustular reactions produced by Noguchi's original luetin in medical students are shown in the accompanying illustrations. These men had repeated negative Wassermann reactions with absolutely negative histories and physical findings. Thirdly, Sherrick[4] has reported that an involuting luetin reaction can be revived by the use internally of

4. Sherrick, J. W.: The Effect of Potassium Iodid on the Luetin Reaction, THE JOURNAL A. M. A., July 31, 1915, p. 404.

AMOUNT OF DOSAGE AND DURATION OF ADMINISTRATION *

Case	Diagnosis	Control Test before Drug Was Given		Drug Administered	Daily Dose, Gr.	Total Dose, Gr.	Time During Which Drug Was Administered	Luetin Injection	24 Hrs	48 Hrs.	72 Hrs.	4 Days	Normal Saline Control	Wassermann on Blood	Spinal Fluid	History of Syphilis
		Luetin	Normal Saline													
1. Mc.G.	Typhoid fever	0	0	KI	15	75	10/11 to 10/15	10/14	papule +	papule +	0	0	0	0	...	0
2. A. P.	Typhoid fever	0	0	KI	15	75	10/16 to 10/20	10/21	papule +	papule +	0	0	0	0	...	0
3. H. J.	Lobar pneumonia	0	0	KI	45	180	10/11 to 10/14	10/14	papule ++	papule ++	pustule ++	pustule ++	0	0	...	0
4. R. P.	Dermatitis	0	0	KI	60	240	8/ 8 to 8/11	8/11	0	0	0	0	0	0	...	0
5. M. L.	Neurasthenia	0	0	KI	48	240	9/20 to 9/24	9/24	papule +	papule ++	pustule ++	pustule +++	0	0	...	0
6. B.	Dermatitis	0	0	KI	48	240	10/ 6 to 10/10	10/11	papule ++	papule ++	.....	.....	0	0	...	0
7. I. B.	Rheumatism	0	0	KI	48	240	10/ 6 to 10/10	10/11	papule ++	papule ++	.....	.....	0	0	...	0
8. M. G.	Neurasthenia	0	0	KI	48	240	10/11 to 10/15	10/14	papule +	pustule +	pustule ++	pustule +++	0	0	...	0
9. C. D.	Endocarditis†	0	0	KI	15	300	9/ 1 to 9/20	9/17	papule +	papule +	pustule ++	pustule +++	0	0	...	0
10. M. G.	Rheumatism	0	0	KI	51	300	9/20 to 9/26	9/24	papule +	pustule ++	pustule +++	pustule +++	0	0	...	0
11. G. B.	Acute bronchitis	0	0	KI	51	360	9/20 to 9/26	9/24	papule +	pustule ++	pustule +++	pustule +++	0	0	...	0
12. P. B.	Multiple sclerosis	0	0	KI	50	600	8/18 to 8/29	8/26	pustule +	pustule +++	pustule +++	pustule +++	0	0	0	0
13. J. F.	Hanot's cirrhosis	0	0	KI	50	600	8/18 to 8/29	8/26	papule +	pustule ++	pustule +++	pustule +++	0	0	...	0
14. F. G.	Depressed fracture	0	0	KI	50	600	8/18 to 8/29	8/26	papule +	pustule ++	pustule ++	pustule ++	0	0	0	0
15. E. M.	Chronic arthritis	0	0	KI	50	600	8/12 to 8/23	8/22	0	0	0	0	0	0	...	0
16. D.	Tuberculous kidney	0	0	KI	55	720	9/14 to 9/26	9/24	papule +	papule +	pustule +++	pustule ++	0	0	...	0
17. V. B.	Typhoid fever	0	0	NaBr	120	300	10/11 to 10/13	10/14	papule +	0	0	0	0	0	...	0
18. M. S.	Rheumatic fever	0	0	NaBr	120	480	10/12 to 10/15	10/14	papule +	0	0	0	0	0	...	0
19. R.	Neurasthenia	0	0	NaBr	120	720	10/17 to 10/22	10/21	papule +	papule +	0	0	0	0	...	0
20. F. K.	Influenza	0	0	KNO_3	72	360	11/ 5 to 11/ 9	11/ 7	papule +	papule +	0	0	0	0	...	0
21. F. R.	Endocarditis	0	0	KNO_3	100	700	11/ 9 to 11/15	11/13	0	0	0	0	0	0	...	0
22. B.	Acute articular rheumatism	0	0	KNO_3	100	800	11/17 to 11/24	11/22	papule +	0	0	0	0	0	...	0
23. H. J.	Lobar pneumonia	0	0	KNO_3	120	840	11/13 to 11/19	11/17	papule +	papule +	pustule +	0	0	0	...	0
24. J. H.	Chronic endocarditis	0	0	KNO_3	80	800	12/12 to 12/21	12/20	papule +	papule +	pustule ++	pustule ++	0	0	...	0
25. St.	Lobar pneumonia	0	0	KNO_3	120	960	12/ 4 to 12/11	12/ 9	0	0	0	0	0	0	...	0
26. S. B.	Rheumatic fever	0	0	KNO_3	120	960	12/ 4 to 12/11	12/ 9	papule +	papule +	0	0	0	0	...	0
27. W. J.	Lobar pneumonia	0	0	KNO_3	80	1120	12/ 8 to 12/21	12/19	papule +	pustule +	pustule +	0	0	0	...	0
28. J. B.	Pediculosis	0	0	KBr	100	500	11/ 2 to 11/ 6	11/ 5	papule +	0	0	...	0	0	...	0
29. F. T.	Asthma	0	0	KBr	100	500	11/ 2 to 11/ 6	11/ 5	papule +	0	0	0	0	0	...	0
30. W.	Pulmonary tuberculosis	0	0	KBr	100	600	11/ 6 to 11/11	11/ 9	papule +	0	0	0	0	0	...	0
31. A. P.	Typhoid fever	0	0	KBr	100	700	11/13 to 11/19	11/17	papule +	0	0	0	0	0	...	0
32. P.	Lobar pneumonia	0	0	KBr	120	960	12/ 4 to 12/11	12/ 9	papule +	0	0	0	0	0	...	0
33. G. V.	Cirrhosis of liver	0	0	KBr	120	960	12/ 4 to 12/11	12/ 9	papule +	0	0	0	0	0	...	0
34. J. K.	Lobar pneumonia	0	0	KBr	120	960	11/27 to 12/ 4	12/ 2	papule +	0	0	0	0	0	...	0
35. J. K.	Lobar pneumonia	0	0	KBr	100	1000	11/ 6 to 11/15	11/13	papule +	papule +	papule +	0	0	0	...	0
36. M.	Chronic endocarditis	0	0	CaBr	100	600	10/17 to 10/22	10/21	papule ++	papule ++	papule +	0	0	0	...	0
37. J. H.	Lobar pneumonia	0	0	NaI	28	280	12/12 to 12/21	12/20	papule ++	papule ++	pustule ++	pustule ++	0	0	...	0
38. A. W.	Cerebellar cyst‡	...	...	None	...	...	.....	9/26	papule ++	papule ++	pustule ++	pustule ++	0	0	...	0
39. G. P.	Typhoid fever	...	...	None	...	...	.....	10/15	papule +	pustule ++	pustule ++	pustule ++	0	0	0	0

* In this table:
+ = positive
++ = strongly positive
+++ = very strongly positive
+ for 24 hrs. = faintly positive reaction
+ for 48 hrs. or more = positive reaction
0 = negative

† Necropsy revealed no signs of syphilis.
‡ Cyst found at operation, nonsyphilitic.

		Pos.	Ft. Pos.	Neg.
Number on potassium iodid	16	14		2
Number on sodium bromid	3	1	2	
Number on potassium nitrate	8	5	1	2
Number on potassium bromid	8	1	7	
Number on calcium bromid	1	1		
Number on sodium iodid	1	1		
Number without drugs	2	2		
Total	39	25	10	4

potassium iodid, or that intradermal injections of a 0.5 per cent. suspension of agar gives rise to a reaction indistinguishable from the luetin test after administration of potassium iodid. Moreover, a nonsyphilitic person taking potassium iodid or having taken it some time before, up to a space of three weeks in his experience, generally responds with a positive test to the luetin reaction. This work has been substantiated by Kolmer, Matsunami and Broadwell[5] and others. In addition, Stokes[6] has found that many normal persons react to intradermal injections of emulsions of normal and pathologic skin, agar-agar and bismuth subnitrate. The purpose of our investigation was to determine especially whether the provocation of the luetin reaction in nonsyphilitic persons is specific for potassium iodid, or whether other substances may have a similar action. This is a matter of some interest from a diagnostic standpoint, for evidently the presence of all provocative substances should be excluded when a diagnostic luetin test is to be made.

Fig. 1.—Delayed pustular reaction in normal medical student; control not visible.

Dr. Sollmann also suggested that the knowledge of the iodid-luetin and related reactions may contribute to the understanding of the mechanism of the iodid action in syphilis and iodism.

Incidentally, we also gathered information as to the frequency of the occurrence of the luetion reaction in normal persons controlled by the Wassermann test, and on the influence of the dosage of the iodid.

Our first work was done with potassium iodid, the usual technic being to make a luetin[7] and Wassermann test, and if negative, to give the patients the drug in 10 or 15 grain doses and upward, three times a day after meals from three to five days or a week, and then apply the luetin test. The accompanying table shows the doses used and the duration of their administrations.

Out of eighteen such cases, fourteen reacted with strongly positive, papular and pustular reactions; two of them were negative, and the other two gave strongly positive reactions to the control test. One of these was a case of a cerebellar cyst with a negative lumbar puncture which afterward came to operation and showed absolutely no signs of syphilis. The other case was one of typhoid with no history or evidence of syphilis and with a negative Wassermann test.

We have, therefore, substantiated the work of Sherrick, Kolmer and others, that (1) some nonsyphilitics respond to luetin spontaneously, and (2) in those nonsyphilitics who do not respond spontaneously, the reaction can generally be provoked by iodids.

Our next problem was to determine whether or not other drugs could provoke the reaction and positive results be attained with bromids and nitrates, which are closely related to the iodids.

Of eight patients on potassium nitrate, five gave strongly positive reactions, one faintly positive, and two negative. With potassium bromid, there was one strongly positive reaction and seven weakly positive out of eight patients tested. We did not try the sulphocyanid ion because of its toxic qualities.

We thought we would try the drug, using another positive ion instead of potassium in the form of the iodids and bromids. The one patient put on sodium iodid gave a strongly positive reaction; the same was also true of one patient on calcium bromid. Out of three patients put on sodium bromid, one had a strongly positive reaction and two weakly positive.

SUMMARY

Out of thirty-nine cases tested by the luetin reaction, two normal persons gave pustular reactions to the control test. Among eighteen taking potassium iodid, sixteen gave positive reactions, these being most strongly positive in those patients who had received from 200 to 600 grains.

This action is found not to be specific for potassium iodid alone, as it was caused, though in a lesser degree, by sodium bromid in three cases tested, by potassium nitrate in six out of eight cases tested, and by calcium bromid and by sodium iodid each in one case tested.

In a future communication we expect to publish the results of our experiments with organic iodin compounds. Perhaps then we shall be in a better position to draw some conclusions as to the action of iodin and as to the syndrome known as iodism.

Fig. 2.—Delayed pustular reactions in normal medical student; control not visible.

2073 East Ninth Street.

5. Kolmer, J. A.; Matsunami, Toitsu, and Broadwell, Stuart: The Effect of Potassium Iodid on the Luetin Reaction, THE JOURNAL A. M. A., Sept. 2, 1916, p. 718.

6. Stokes, J. H.: Jour. Infect. Dis., 1916, **18**, 402, 415. We are indebted to Stokes' careful articles for a portion of the historical material on the luetin reaction already quoted.

7. The luetin used in this investigation was kindly furnished by the H. K. Mulford Company.

Early Psychology.—To laugh, if but for an instant only, has never been granted to man before the fortieth day from his birth, and then it is looked on as a miracle of precocity.—Pliny the Elder, "Natural History."

A "LUETIN" REACTION IN SYPHILIS PRODUCED BY AGAR

WITH A BRIEF CONSIDERATION OF ITS MECHANISM *

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The enthusiasm with which cutaneous tests for diagnostic purposes have been incorporated into clinical practice is a striking tribute to the uncritical frame of mind in which we are prone to receive what promises to present the golden combination of simplicity and usefulness. Few better illustrations of this ready acceptance of the plausible as gospel could be found than the reception accorded the luetin reaction.

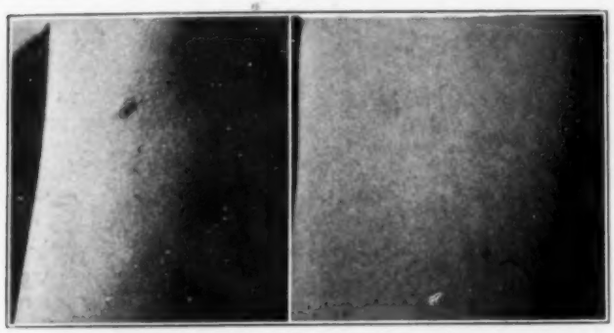


Fig. 1.—The positive (left) and negative (right) reactions to agar on the fourth day after injection of 0.1 c.c. of a 0.7 per cent. suspension. Both patients (women) had syphilitic periostitis and total inhibition Wassermann tests. The oil controls (indicated by the arrows) are negative.

Before Sherrick[1] noted the effect of iodids on the reaction, the literature was flooded with favorable, but now almost worthless reports, from a large percentage of which it is impossible to determine what controls were used and in which controls were even admittedly dispensed with. Here and there more critical observers called attention to the uncertainties of the reaction, and to the behavior of some of the control suspensions distributed with authentic Noguchi preparations of luetin. My own interest in the specificity of the reaction and its possible mechanism was first aroused by the production of a very convincing luetin reaction in a case of late syphilis in which I was studying the sensitization phenomena of psoriasis by means of intradermal injection of an emulsion made from normal skin. Following this I discovered to my surprise that as the apparent result of a series of injections of homologous protein emulsions made from our own skins, my skin and that of my assistant reacted to a typical colloid (agar) in a way clinically identical with the tardive luetin reaction.[2] This sensitivity apparently diminished slowly after the experiments were discontinued. Having in the meanwhile developed a theory of the mechanism of such reactions based on the newer physicochemical conceptions of anaphylactic phenomena, founded on the work of Bordet, Mutermilch and Kopaczewski, Keyser and Wassermann, Jobling and Petersen, Novy and DeKruif and others, I undertook to see whether a typical colloid suspension, whose properties as an anaphylatoxin-former were well understood, would give rise to reactions like the luetin reaction, in states of dermal hypersensitivity such as we know to exist in a certain percentage of syphilitics. The purpose of this paper is to report the success of the attempt based on these theoretical considerations, the fuller consideration of the significance of the result being deferred for a future paper. Sherrick[1] and Kolmer[3] have both noted that a reaction occurred under potassium iodid, but neither has observed its reaction when potassium iodid has not been administered, possibly because of its slow development, which sometimes calls for a period of observation of not less than fourteen days fully to identify a positive reaction.

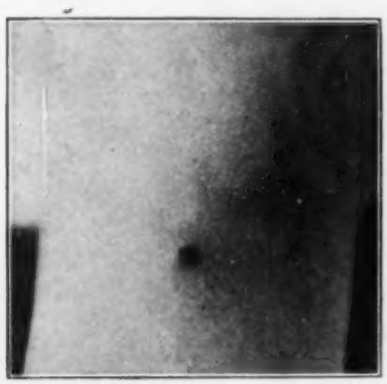


Fig. 2.—The positive shown in Figure 1 (left), on the eighth day. Hemorrhagic pustule.

Agar presents the striking advantage over many of the bacterial protein suspensions, toxins, etc., used for intradermal tests, that its behavior in vitro and in vivo has been fairly well worked out in the development of newer immunologic conceptions. It has been shown with reasonable definiteness that as a colloidal suspension it is able, by an absorptive action, to render homologous serums, which are supposedly nontoxic, extremely toxic, and that this effect is related to the colloidal properties of blood serum. This generation of anaphylatoxin by agar, its ability to disturb colloidal equilibrium along certain constant lines without itself being broken up or subjected to chemical change, makes it a very favorable medium for the study of the colloidal equilibrium of tissues in normal and disease conditions. The ability to show that agar in proper concentration, intradermally injected, gives rise, in states of dermal hypersusceptibility, to inflammatory reactions clinically similar to the luetin reaction, suggests that the mechanism of luetin is at least in part physical and not chemical. Moreover, it is possible that the hypersensitiveness which permits of such a reaction is also a physical state, the peculiarities and

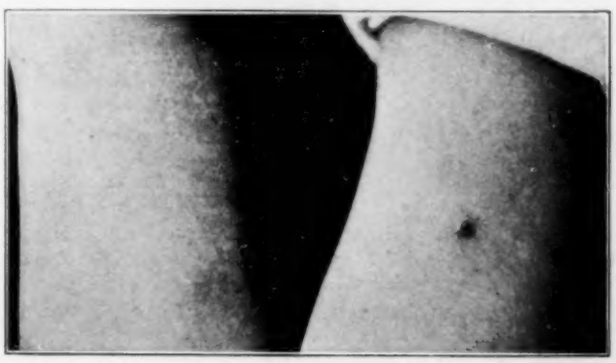


Fig. 3.—The reactions shown in Figure 1 on the ninth day: right, positive; left, negative.

* From the Section of Dermatology and Syphilology, Mayo Clinic.

1. Sherrick, J. W.: The Effect of Potassium Iodid on the Luetin Reaction, THE JOURNAL A. M. A., July 31, 1915, pp. 404-405.

2. Stokes, J. H.: Studies on Intradermal Sensitization, II, An Intradermal Reaction to Agar and an Interpretation of Intradermal Reactions, Jour. Infect. Dis., 1916, **18**, 415-436.

3. Kolmer, J. A.; Matsunami, Toitsu, and Broadwell, Stuart: The Effect of Potassium Iodid on the Luetin Reaction, THE JOURNAL A. M. A., Sept. 2, 1916, pp. 718-719.

origin of which can be worked out along physical lines of investigation. As a result of my studies of the behavior of this substance when substituted for luetin, I am inclined to regard the hypersensitiveness of the skin in late syphilis, familiarized as *Umstimmung* by the studies of Neisser, Finger and Landsteiner and others, as a colloidal phenomenon, and to regard the action of luetin largely as that of a mixture of colloids, the adsorbent action of which makes possible the liberation of anaphylatoxin in the tissue in which it is injected, with a resulting inflammatory reaction about the site of injection. Critical analysis of the composition of luetin as originally prepared by Noguchi[4] justifies this belief, since the anaphylatoxin-forming properties of ground *Spirochaeta pallida* have been demonstrated[5] as well as those of agar. To justify this theory it remained to show that, independent of the influence of iodids, a reasonable percentage of syphilitics would react to a colloidal adsorbent in suitable concentration in a way clinically similar to the luetin reaction. While the series of cases here reported is not large, it certainly suggests that there is a hitherto only partly appreciated element of nonspecificity in this reaction. It is not proposed to attack the clinical serviceability of luetin in the diagnosis of obscure syphilis, or to propose agar as a substitute without considerably more study. On the other hand, it cannot but give us pause in our enthusiasm for the diagnostic value of luetin and its immunologic significance to find that not only can the reaction be utterly invalidated by a little potassium iodid, but that it can be perfectly imitated by a sterile colloidal suspension which experimental studies seem to indicate remains chemically inert and acts presumably only through its physical properties. The reaction to agar as here described was negative in a variety of nonsyphilitic conditions and in the normal persons on whom it was tried. It was mildly positive on five occasions in clinically and serologically nonsyphilitic persons, two of whom, however, had gonorrheal arthritis, and three of whom had been receiving massive injections of vaccines, the ability of which to alter the colloidal state of the body and bring about so-called ferment mobilization has been suggested by the work of Jobling and Petersen[6] and others.

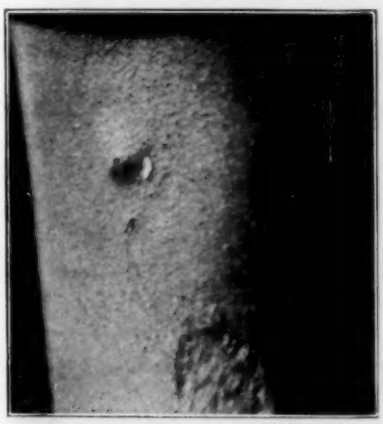


Fig. 4.—A positive reaction on the third day, which then subsided. Rated as doubtful and discarded. Hereditary syphilis with a negative Wassermann test.

The preparation used in my work has been a sterile 0.5 per cent. suspension of granular or powdered agar in physiologic sodium chlorid solution (unfiltered), sterilized in the autoclave. In more recent reactions I have used a 0.7 per cent. suspension. Several preparations of agar have been employed to eliminate the possibility of the presence of peculiarities due to the method of manufacture. The gel, undiluted, is injected intradermally in amounts of 0.1 c.c. An equal amount of mechanical trauma, inflicted by the injection of 0.1 c.c. of sterile olive oil as a control, has failed thus far to produce any positives, even when

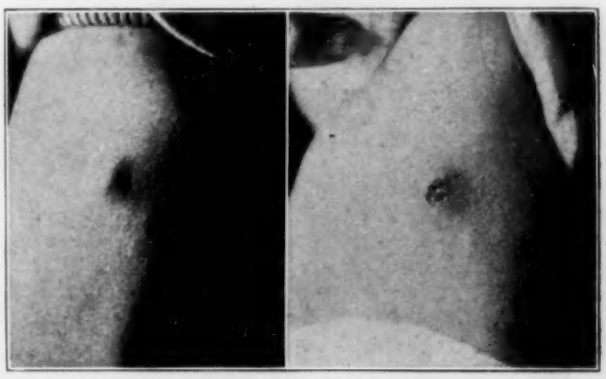


Fig. 5.—A reaction which was positive on the third day, subsided and lighted up again on the eighth; left, pustulobullous lesion on the eleventh day; right, ruptured and drying pustule on the fourteenth day. Tabes dorsalis, blood Wassermann test positive, no iodids.

the agar reaction is positive. The course of the reaction is quite similar to that of luetin, with emphasis on the tendency to tardive reaction. Pustulation occurs, in marked cases, usually after the fifth day, and often as late as the tenth or twelfth. The pustule is rather more hemorrhagic than the typical luetin lesion, and occasionally bullous. Cultures from the fluid in several lesions and microscopic examinations have shown it to be sterile. There is a distinct variation in the intensity of the reaction with the concentration of the agar, and it is my impression also that certain obscure properties of the colloid suspension, such as may result from shaking it before it has gelled, and chilling it affect its behavior. Even though they seem to have been made up in the proper percentage strength, preparations occasionally give unsatisfactory results, especially when they are thin and watery or very flocculent. Variations of this type can scarcely have been avoided in the manufacture of luetin, and may explain the occasionally erratic behavior of even authentic preparations.

Fig. 6.—Drying pustule on the ninth day in latent syphilis with a positive Wassermann test. Mercuric succinimid intramuscularly, and salvarsan; no iodids.

It must be apparent that luetin, as a marketable preparation for the diagnosis of syphilis, is an uncertain entity and that, to say the least, it needs standardization.

4. Noguchi, N.: A Cutaneous Reaction in Syphilis, Jour. Exper. Med., 1911, **14**, 557-568.
5. Nakano, H.: Ueber Kutireaktion bei Syphilis, Part I, Arch. f. Dermat. u. Syph., 1913, **116**, 281-312.
6. Jobling, J. W., and Petersen, William: The Nonspecific Factors in the Treatment of Disease, THE JOURNAL A. M. A., June 3, 1916, pp. 1753-1756.

In the summary of results in the accompanying table, reactions have been interpreted as positive with conservatism. Slight infiltrations, bluish macules, and even small papules which failed to show the tendency to central softening have been rated as doubtful and discarded. No reaction has been considered until after the third day. Marked reactions are unmistakable, and give rise to a deep pustule which may enlarge as if by process of peripheral digestion of the tissues, until it becomes flaccid or is evacuated, discharging a grumous pus and leaving a marked bluish or purple scar. The reaction is slower to develop than the luetin, and on the whole more indolent, and it is this tardive tendency perhaps which has caused other observers to overlook it. The inflammatory areola, which may disappear after the second day, may reappear when the reaction begins to light up. The reaction is usually markedly accelerated by iodids, forms a higher, firmer nodule, and evacuates sooner. In two cases, one of latent syphilis and one of actinomycosis (moribund), the reaction failed to develop even under liberal doses of potassium iodid.

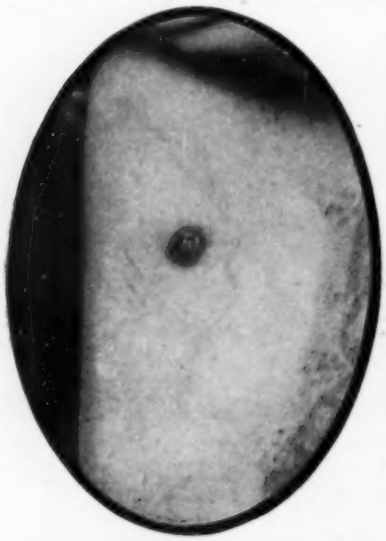


Fig. 7.—Fifteenth day pustule, early secondary syphilis receiving only intramuscular injections of mercuric salicylate.

In the Chicago cases, studied through the courtesy of Dr. F. G. Harris at the Cook County Hospital, the percentage of positives was higher than on my own service at Rochester, possibly because the former patients were subject to the uncertainties of outside treatment with possible iodid administration, whereas in the cases of the latter the question of iodid administration was effectually eliminated, the majority of the patients being under my care for some weeks without iodids before the reactions were started, and the diagnosis of syphilis having been made on most of them for the first time when they entered the clinic. In the Chicago series a 0.5 per cent. suspension was used, and in the Rochester series a 0.7 per cent. suspension. Suspensions of 0.1 per cent. and 1.0 per cent. were tried, but gave unsatisfactory and usually negative results. In comparing with my results the percentage of positives obtained for luetin by observers before the influence of iodids was recognized, it should not be forgotten that the published percentages for luetin are undoubtedly inflated by the unsuspected effect of iodids and should therefore be lower than the reports indicate.

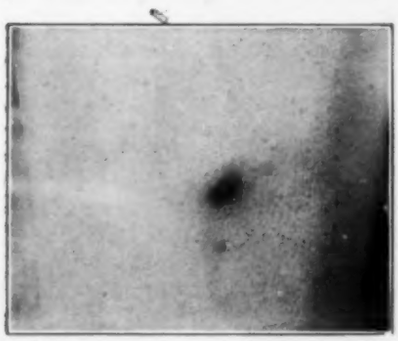


Fig. 8.—Tardive pustulobullous lesion, twenty-first day. Nodulo-ulcerative late syphilid of the face, gumma of the palate. Salvarsan; mercuric succinimid intramuscularly; no iodids.

The nonsyphilitic cases in which negative reactions were obtained included 6 cases of psoriasis, 3 of eczema, 2 of toxic erythema, 1 of chancroid, 3 of pulmonary tuberculosis, 1 of acne vulgaris, 1 of pellagra and 1 of actinomycosis of the appendix.

A positive reaction was obtained in one case in which syphilis certainly was not present — a case of urticaria pigmentosa in an adult. Of three cases of gonorrheal arthritis, two were positive to agar with negative Wassermanns, but both of these patients had been receiving vaccines with marked reactions and, moreover, syphilis could not be excluded. In another case from which syphilis could not be excluded but which was Wassermann-negative, the patient reacted positively while receiving vaccine for a sycosis, with marked febrile responses. With reference to gonorrhea it will be recalled that Boas and Ditlevsen,[7] among others, secured positive luetin reactions in several patients with gonorrhea in their series, and even in persons who were apparently normal.

In the Chicago series of twelve patients with syphilis, two reactions were discarded as doubtful, and seven (70 per cent.) reacted positively.

In the Rochester series (0.7 per cent. agar used), of thirty-five patients with syphilis, five reactions were discarded as doubtful, and fifteen (50 per cent.) reacted positively. Rating the doubtfuls as negative, the percentage of positives was 42.3.

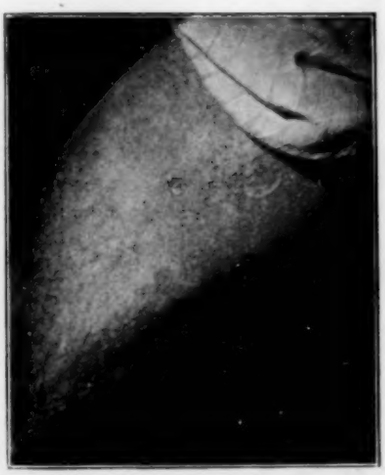


Fig. 9.—Negative reaction in bullous erythema multiforme. Patient seen some weeks later; no signs of lighting up.

The accompanying table combines the two series, omitting all doubtful reactions.

It is interesting to note that positive reactions were obtained for all but two of nine tabetics (about 78 per cent.). The increasing frequency of positives in the later stages of the disease is in keeping with the behavior of luetin.

From my observations as the work has progressed, I have gained the impression that the positive reaction can be brought out by intensive treatment, exclusive of iodid administration, notably by intramuscular injections of mercurial salts. This is in keeping with the opinion of observers of syphilis and will be discussed with the theoretical considerations in another paper.

CONCLUSIONS

Agar hydrosol, from 0.5 to 0.7 per cent., in physiologic sodium chlorid solution, when injected intradermally in doses of 0.1 c.c., gives reactions clinically similar to those produced by luetin. Controls of

7. Boas, H., and Ditlevsen, C.: Untersuchungen über Noguchis Luetinreaktion, Arch. f. Dermat. u. Syph., 1913, **116**, 852-864.

equal amounts of sterile olive oil, producing similar trauma, do not give rise to reactions.

The agar reaction differs from the luetin reaction chiefly in a tendency to a more torpid course and a slower development.

Papular and pustular reactions may be produced, the latter being somewhat more hemorrhagic than those produced by luetin.

The percentage of positives in known syphilitics, eliminating doubtful reactions, varied in two series aggregating forty cases, from 50 to 70 per cent.

The normal persons and nonsyphilitics in my series did not react. The only positive case in which syphilis seemed to be eliminated was a case of urticaria pigmentosa with factitial urticarial phenomena. Two patients with gonorrhea in a total series of seventy-six reacted positively. Both were receiving vaccines with marked reactions. One patient with sycosis barbae, receiving vaccines with marked reaction, also reacted positively to the agar.

The influence of iodids could be eliminated from the series in which 50 per cent. reacted positively.

Fig. 10.—Iodid reaction to agar. Pustule ruptured on the sixth day. Patient with syphilitic aortitis, receiving salvarsan, intramuscular injections and 20 grains of potassium iodid, three times a day.

The positive reaction to agar as brought about by the internal administration of iodids was observed in typical form in three cases. It is simply a severe form of the luetin and agar reactions. In two cases in which iodids were being administered, the reaction to agar was negative.

The cutaneous reaction to both luetin and agar in syphilis is interpreted as nonspecific in character and as a colloidal adsorption phenomenon in a hypersensitive or labile skin. The theoretical considerations on which this view is based have been published in part, and a review of their possible bearing on the immunologic mechanism of syphilis will be published shortly.

RESULTS OF TESTS

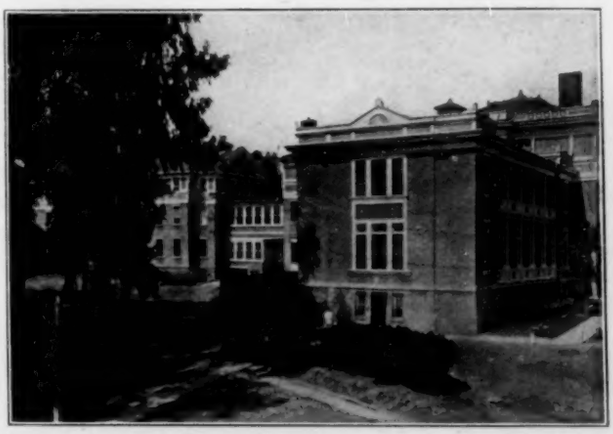
Form of Syphilis	Positive		Negative
	Number	Per Cent.	Number
Primary	2	66	1
Latent	2	40	3
Secondary	3	43	4
Tertiary	6	55	5
Cerebrospinal	8	62	5
Total Early	..	46.6	..
Total Late	..	58.3	..

The importance of a further study and standardization of preparations of "luetin" is suggested. The foregoing studies suggest that the fragmented *Spirochaetae pallidae* are not indispensable in the production of the reaction clinically known as the luetin test.

THE NAVY, AND ITS RELATION TO THE MEDICAL PROFESSION IN TIME OF WAR

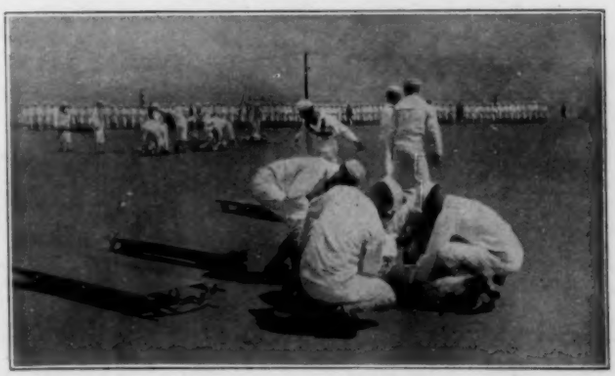
R. C. HOLCOMB. M.D.
Surgeon, United States Navy
WASHINGTON, D. C.

For more than two and a half years we have been watching the evolution of a gigantic conflict involving



The naval hospital, Mare Island, Calif. This is one of a large system of naval hospitals maintained by the navy at the various naval stations along the east and the west coast of the United States.

the peoples of the greater part of Europe and Asia, our near neighbor Canada, and far off Australia. In these fateful days our sober thoughts search for a lesson from which we may profit. Our nation has been profoundly stirred by the horrors of this war, and it is not surprising that, being thus deeply stirred by the dangers of a general war conflagration, patriotic impulse searches for a method of expressing itself. Individuals and organized groups of individuals are coming forward, offering their skill and their services. But if we are without a clear understanding of the

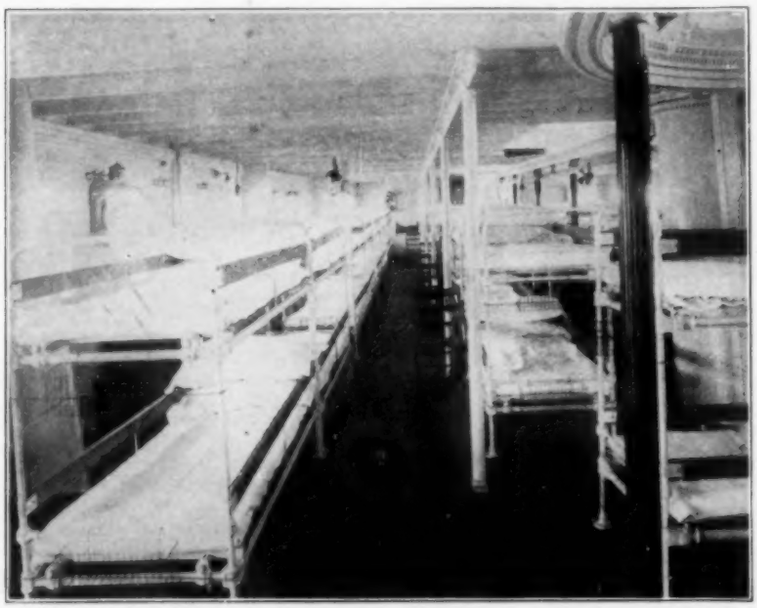


Members of the hospital corps at drill. There are three large hospital corps training schools located at the various training stations, where the members of the hospital corps are instructed in their duties before going to naval hospitals or to duty aboard the hospital ships.

fundamental needs of the situation, if we are without a sympathetic exchange of purpose, if we are without a definition of requirements, the result will not aid our military and naval services, but will lead only to misunderstanding, confusion and bewilderment.

I have often found in discussing the needs of the Medical Department of the Navy that the subject is confused with the needs of the army. Plattsburg

camps and base hospitals occupy the field of mental vision, and the ocean and ships are somewhere far over the mental horizon. It is my purpose, therefore, as briefly as possible, to outline a concise statement as to where we should look for aid, and what circumstantial, national and other considerations must direct us.



Ward aboard the Hospital Ship *Relief*, utilized by the army as a hospital ship during the war with Spain, and later taken over by the navy. She is now unseaworthy, but is still used for hospital purposes at the Naval Station, Olongapo, P. I.

To begin with, the fighting ships of the navy must be built before war descends on us. The protection that stands between our coasts and an enemy from over the sea is vested in the navy. Of all our frontiers, our ocean frontier is the greatest. Against an over-sea enemy the navy is the first line of defense. Our strength or our weakness at the beginning of hostilities will decide whether or not the invader can secure a foothold on our shores. What I wish to emphasize is that unlike an army, which can expand and expand as long as there is land to hold it and men to constitute it, the navy has limitations as to personnel and its requirements, limitations which can be quite accurately determined by the number of its fighting units before the outbreak of hostilities. It is not the number of men that constitutes a navy, it is the number of ships with trained men to man them. Battleships cannot be built in a day. The need for power on the sea, so far as our country is concerned, would be immediate. The navy must always be ready for war, not tomorrow, but today. For the navy that is unprepared there may be no tomorrow; for the personnel of such a navy tomorrow may be too late.

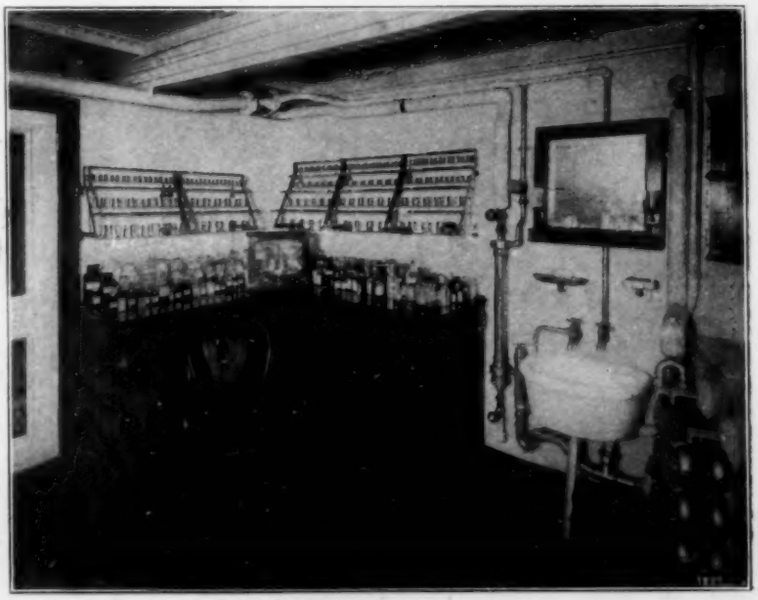
Our naval medical officers are a highly efficient body of specialists, always seeking the solution of the problems which are peculiarly theirs, and which belong to the man who must separate himself from normal or usual considerations. In the march of sanitary progress the naval medical officers have sought a place in the van. It is not, therefore, assistance in reorganizing the Medical Department of the Navy that we need, but assistance in organizing the civilian facilities outside of our sphere of naval influence to supplement the organization already a part of a great machine, so that when war comes, order and preparedness will take the place of confusion.

RECRUITING OFFICERS

We should first need to recruit our navy and marine corps to full strength. For this purpose, additional recruiting medical officers are lacking. Medical officers for our auxiliaries must be supplied. Auxiliaries are ships which carry supplies for the fleet — a sort of floating base which carries supplies of fuel, food and ammunition, and which contains ships employed as district scouts, ships employed with submarine and aeronautic activities of a district, and, not the least of these, the hospital ships.

To man most of these ships with medical officers we must look to our professional brethren who are now engaged in peaceful pursuits. The duties of the medical officer will take him on the ocean where his professional isolation is complete, and where he must solve from his own resources all the problems that may confront him. He should be a young man ready for any hardships, and possessing a large fund of temperamental compatibility.

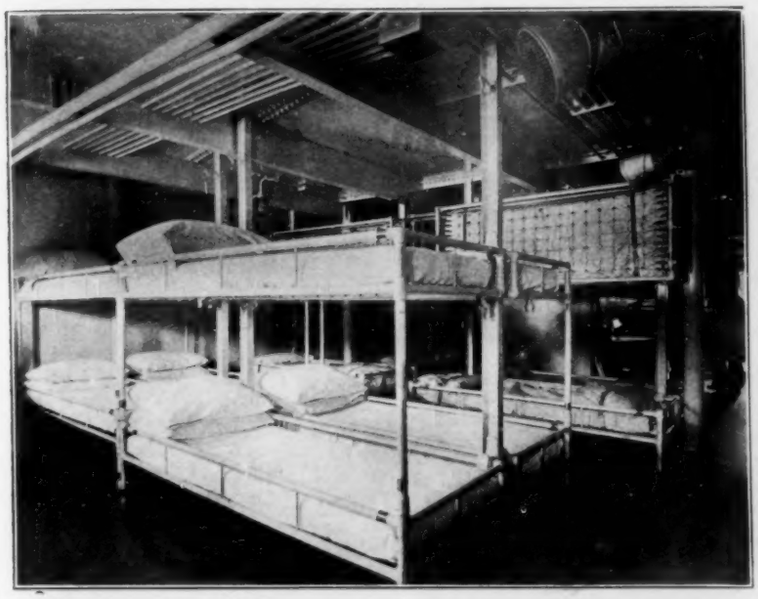
When our ships turn back from the sea bringing their sick and wounded, their destination will not be Chicago or St. Louis, but coast cities where we have our navy yards and stations, such as Boston, New York and Philadelphia, where the navy maintains navy yards and naval hospitals. As some of these hospitals may not be large enough to meet the requirements, we must look to the civilian hospital facilities at these places to help us out. Hence our interest is keen in the hospitals of these particular coast cities, and therefore



Dispensary aboard a battleship.

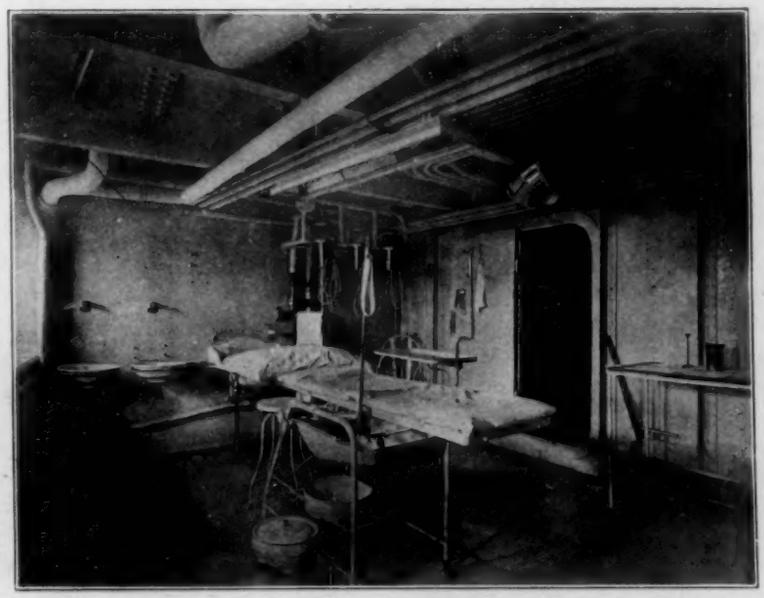
we have carefully compiled information of all the large municipal and private hospitals in these cities, tabulated, filed and kept up to date.

As not all of our bases promise such facilities as places like New York, Boston or Philadelphia, we have asked the Red Cross to organize five hospital units. We have requested that three of these units be organized on the east coast, preferably at Boston, New York and Philadelphia, and that two be organized on the west coast, preferably at San Francisco and Los Angeles.



The sick bay of a battleship. This is the name given to the hospital ward aboard a ship of the navy. These spaces vary in size from a compartment containing half a dozen bunks to a large compartment containing sometimes as many as forty bunks.

I do not wish to convey the impression that all the interest of the navy in civilian hospital facilities is limited to hospitals adjacent to existing navy yards and stations, for this is not true. The navy defends the whole coast, so that every hospital on the east or west coast or adjacent to these coasts commands our special interest. For purposes of defense the coast of the United States is divided into districts. Each of these districts has its scouts, submarines and ships of defense, its coast guard, and other district naval activities. Therefore a survey has been made and information compiled concerning all the important civilian hospitals in each naval district, so that these district ships and naval activities may know their district hospital facilities. In these hospitals we have the same keen interest that we have in the hospitals of those cities in which are located the large navy yards and stations — the home bases of our fleet in time of peace or war.



An operating room aboard a battleship. This room is completely equipped with sterilizing equipment, consisting of dressi ng, utensil and instrument sterilizers.

NAVAL CASUALTIES

There are never the overwhelming numbers of wounded after a sea battle that there are after a battle on land, for a modern sea fight is not a fight among individuals, but a fight of ship against ship, a fight between monsters, a fight for annihilation, and we probably should come back as victors or not at all. Some authorities have placed the possible casualties in a naval battle of large fleets, including the rescued enemy, at 3,000 wounded, 5,000 being the outside number of those who would have to be cared for. Certainly no naval fight up to the present time has left the fleets with such a large number of wounded as this. But there would also be the usual morbidity which is experienced in time of peace, the result of exposure, and the hazard of life on the sea. No one can say when, how or where an enemy will strike, and it therefore behooves us to be ready to handle the results of morbidity and battle anywhere along our thousands of miles of coast, where the activities of the navy may take us.

New problems of warfare are confronting armies. This may be illustrated by referring to Germany's western front. No longer do visible armies meet each other for a quick and decisive victory, but foes invisible to each other, encamped in dugouts and fighting from trenches, are carrying on a sort of subterranean warfare, terrible and ruthless. Not that the older type has passed away, for the eastern front of Germany and Austria has been characterized by sharp and decisive campaigns of rapidly advancing troops; but this new type of warfare has been added to the older. The value of cavalry and light artillery has not been destroyed.

And so, too, navies are confronting a new type of warfare. But this newer method of warfare has been added without destroying the power and usefulness of battleships. This added menace, like the new problems confronting armies, is invisible in its essentials. It is submarine in character. In place of the trench and dugout we have the submersible boat. Medical personnel must adjust its ideas to the newer type of warfare as well as to the older. Brilliant triumphs in

surgery have little place here. Physical, chemical, bacteriologic and physiologic problems in their relation to the atmosphere and the human mechanism will demand careful consideration to insure the physical fitness and safety of the men who go down into the sea in these boats.

Surgeon's examining room aboard a battleship.

THE SICK OF THE NAVY

The sick of the Navy and Marine Corps are cared for solely by the medical officers of the service. There are two classes of medical officers; those who enter the regular service and adopt it as a calling for life and those who enter in a reserve capacity for four years at a time, obligating themselves to go on active duty at the call of the president.

PRELIMINARIES FOR APPOINTMENT

The preliminaries for appointment differ principally in the character and scope of the professional examination, which is more searching in the case of those coming in permanently, and due to go to the Naval Medical School for instruction and after this course to be examined, graded and commissioned in the regular service.

The regular medical corps of the navy today has nearly 400 officers. There are now nearly 300 vacancies, as the numerical strength of the corps has recently been fixed by law at 0.65 per cent. of the total strength (officers and men) of the Navy and Marine Corps, including midshipmen. Automatically, each increase in the total authorized strength brings with it proportionate increase in number of medical officers.

The lower grades of the Medical Corps advance in rank from time to time along with the officer of the line with whom they take precedence up to the grade of lieutenant commander (corresponding to major in the army). The new law authorizes that 0.5 per cent. of the Medical Corps shall be medical directors with the rank of rear admiral, 4 per cent. shall be medical directors with the rank of captain (corresponds to colonel in the army), 8 per cent. shall be medical inspectors with the rank of commander (corresponds with lieutenant-colonel in the army).

QUALIFICATIONS

A candidate for appointment in this corps must be between the ages of 21 and 32 years, must be a citizen of the United States, and must submit satisfactory evidence of preliminary and medical education. Original appointment in the medical corps is made only in the grade of assistant surgeon. For each advance in rank and grade the candidate is required to undergo a physical and professional examination. The examination for appointment is in two stages. The first examination qualifies the applicant for appointment in the Reserve Force. If successful the candidate then, on full pay, attends a course of instruction at the Naval Medical School, at the end of which course he appears for final examination for appointment in the Medical Corps. The pay of the various grades of the Medical Corps is given in the accompanying table.

The physical examination is thorough and the candidate is required to certify that he is free from all mental, physical and constitutional defects.

Acuteness of vision $^{12}/_{20}$ for each eye, unaided by glasses, but capable of correction by aid of lenses to $^{20}/_{20}$, is obligatory. Color perception must be normal and the teeth good.

SURGEON-GENERAL WILLIAM C. BRAISTED, UNITED STATES NAVY.
[Copyright by Harris & Ewing.]

If the candidate is found to be physically disqualified, his examination is concluded, but in the case of a candidate otherwise desirable the medical examiners may recommend that minor disqualifications or departures from standard be waived and proceed with the professional examination, subject to final approval by

the department; if found to be physically qualified, his professional examination is continued as follows:

1. Letter to the medical examiners, giving a brief statement of the candidate's general and professional education.

2. Written examination (*a*) anatomy, (*b*) physiology, (*c*) materia medica and therapeutics, (*d*) general medicine, (*e*) general surgery, and (*f*) obstetrics. Two or more questions are asked in each subject.

3. An oral examination is conducted in each of the above enumerated subjects.

4. The medical examiners will give careful consideration to composition and spelling as shown in the written papers submitted by the candidate.

5. As a general average, 75 per cent. is required.

With the consent of the medical examiners a candidate may withdraw at any time from further examination and may at a future time present himself for reexamination provided such examination is not delayed until after the date his permit would expire.

No allowance will be made for the expenses of candidates appearing for examination.

After approval of the record of examination and the recommendation of the medical examiners in the case of a qualified candidate the Bureau of Medicine and Surgery will recommend to the Bureau of Navigation the provisional enrolment of the candidate in the United States Naval Reserve Force.

The final physical examination is thorough in character. No person will receive an appointment whose physical condition may indicate the possibility of early retirement for disability.

PAY AND ALLOWANCE TABLE

Grade, Rank, and Length of Service	Pay per Annum on Shore	Allowances per Annum for Quarters*	Total Pay per Annum on Shore	Pay per Annum at Sea
Asst. surg., passed asst. surg., and surg.:				
Rank of lieutenant (junior grade)	$2,000	$432	$2,432	$2,200
Rank of lieutenant	2,400	576	2,976	2,640
After 5 years' service	2,640	576	3,216	2,904
After 10 years' service	2,880	576	3,456	3,168
After 15 years' service	3,120	576	3,696	3,432
Rank of lieutenant commander	3,000	720	3,720	3,300
After 5 years' service	3,300	720	4,020	3,630
After 10 years' service	3,600	720	4,320	3,960
After 15 years' service	3,900	720	4,620	4,200
After 20 years' service	4,000	720	4,720	4,400
Medical inspectors, rank of commander:				
After 15 years' service	4,500	864	5,364	4,950
Medical directors, rank of captain:				
After 15 years' service	5,000	1,008	6,008	5,500
Medical directors, rank of rear admiral:				
Lower half	6,000	1,152	7,152	6,600
Upper half	8,000	1,296	9,296	8,800
Surgeon general, rank and pay of rear admiral	*			

* Both within and (on shore duty) beyond the continental limits of the United States, but only when quarters are not furnished by the government.

Note.—There are also liberal allowances for fuel and light on shore at home and beyond the continental limits of the United States, the amount varying according to rank, season, and the latitude of the station at which the officer is serving.

The school examination will be on the subjects embraced in the course of instruction, such as naval and general hygiene, naval and operative surgery, tropical medicine and pathology, medical zoology, practical chemistry, bacteriology and serology, ophthalmology, Naval Regulations, Hospital Corps drills, and duties of the medical officer afloat and ashore.

Members of each school class, on graduating from the Naval Medical School, will be commissioned in the order of merit as determined on their examination, but not in excess of the number of vacancies in the Medical Corps.

Since no officer can be commissioned in the Medical Corps who is over 32 years of age, permits to attend the course at the Naval Medical School will not be issued to applicants who cannot complete the prescribed course and obtain their appointment while within the age limit.

NAVAL RESERVE CORPS

The act of Aug. 26, 1916, provided for a naval reserve force. A candidate for enrolment as a medical officer is first examined for enrolment in the provisional grade of assistant surgeon, rank of lieutenant (junior grade), United States Naval Reserve Force. After his enrolment, should he so desire, he makes request for active duty for confirmation in grade, and after the completion of a minimum period of three months' active service (at sea) he is again examined and, if found qualified, is recommended for a commission as an assistant surgeon, United States Naval Reserve Force.

Legislation establishing the United States Naval Reserve Force contains in substance matter referable to commissioned grades in the Medical Corps as follows:

A member must be a citizen of the United States.

He obligates himself to serve in the navy throughout a war or during the existence of a national emergency declared by the president, should either arise during his term of enrolment.

Enrolment is for a term of four years.

In time of peace, and when no national emergency exists, a member may be discharged on his own request, on reimbursing the government for any clothing gratuity that may have been furnished during his current enrolment.

A provisional grade (assistant surgeon) is given to him on first enrolment, in accordance with his qualifications determined by examination.

On his own request, he may, after enrolling, be assigned to active duty in the navy for such periods of instruction and training as may enable him to qualify for and be confirmed in grade.

For confirmation in grade a member must serve the minimum amount of active service required (three months in one period, or in periods of not less than three weeks each year), and must qualify by examination under regulations prescribed by the secretary of the navy.

No one can be appointed or commissioned an officer in any rank in any class of the United States Naval Reserve Force, or promoted to a higher rank therein, unless he has been examined and recommended for such appointment, commission or promotion by a board of three naval officers, or until he shall have been found physically qualified by a board of medical officers to perform the duties required in time of war, except that former officers and midshipmen of the navy who shall have left the service under honorable conditions and who shall have enrolled in the United States Naval Reserve Force may be appointed in the grade and rank last held by them without examination other than the physical examinations herein prescribed.

A member receives retainer pay of $12 per annum while enrolled in the provisional grade, provided he

makes such reports concerning his movements and occupation as may be required by the secretary of the navy. After confirmation in grade, his annual retainer pay is two months' base pay of the corresponding rank in the navy. Retainer pay is in addition to any pay to which a member may be entitled by reason of active service. Members of the Volunteer Naval Reserve do not receive any retainer pay.

A member who reenrolls for a term of four years, within four months of expiration of last complete enrolment, and who has performed the minimum amount of active service required during the preceding term of enrolment, for each reenrolment receives an increase of 25 per cent. of his base retainer pay. A member who completes twenty years of service, and who has performed the minimum amount of active service during each term of enrolment, on his own application will be retired with rank held, with a cash gratuity equal to the total amount of his retainer pay during his last term of enrolment.

Employment may be accepted in any branch of the public service, except as an officer or enlisted man in any branch of the military service of the United States or any state thereof.

A member is subject to the laws, regulations and orders for the government of the regular navy only during such time as he may by law be required to serve in the navy in accordance with his obligation, and when on active service at his own request, and when employed in authorized travel to and from such active service in the navy.

A distinctive badge or button will be issued to be worn only by members of the United States Naval Reserve Force. A penalty is assigned for unauthorized persons to wear or use this emblem.

A man actively employed receives the same pay and allowances, gratuities and other emoluments as an officer of the naval service on active duty of corresponding rank and of the same length of service (see pay table quoted above). When not actively employed, he is not entitled to pay, bounty, gratuity or pension, except as expressly provided by the provisions of the act.

When first reporting for active service for training during each period of enrolment, each officer is credited with a clothing allowance of $50, excepting in the Volunteer Naval Reserve. In time of war or national emergency he is credited with $150, less the amount previously credited, if any, during the current enrolment. The various grades not above lieutenant commander in rank, corresponding to those in the navy, are allowed. Officers in the United States Naval Reserve Force rank with, but after, officers of corresponding rank in the navy, and are commissioned by the president.

Medical officers enrolled in the United States Naval Reserve Force shall be appointed in time of peace not to exceed 500 in number. To provide for promotion, those who reenroll within four months after the termination of each enrolment, and who have performed the minimum amount of active service required (at sea) in each enrolment, may receive promotion to the rank of lieutenant on third enrolment, and to the rank of lieutenant commander on the fifth, on performing the minimum amount of active service required (at sea) in the new enrolment, provided they are found on examination qualified physically and professionally.

While the greater number of naval medical reserve officers will probably be needed at sea, some might be detailed to duty on shore—for a time at least—in connection with recruiting and the various medical activities at one of the large navy yards or stations. A naval medical correspondence course has been established at the Naval Medical School, Washington, D. C., to prepare these reserve officers for their duties. For duty at sea they may be assigned as junior medical officers of battleships or on board scouts or cruisers, or aboard any of the various types of auxiliaries which are employed in connection with fleet or district activities.

The life in the fleet calls for the best young manhood of the medical profession. The duty is stimulating, and one lives among men who have high traditions to preserve, although there is often isolation from a professional standpoint, and the best qualities of professional courage and ingenuity are sometimes needed. Not infrequently there is opportunity for rare adventure. The medical officer living among messmates whose life is devoted to the work at hand grows to realize that he is a constituent part of a mighty machine consecrated to the defense of the nation.

Bureau of Medicine and Surgery, Navy Department.

Therapeutics

HEXAMETHYLENAMIN IN THE PYELITIS OF INFANTS*

Probably few drugs have come into such vogue as has hexamethylenamin for the treatment of infections of the urinary tract. Properly administered, it undoubtedly yields satisfactory results in these conditions. There appears to be danger, however, that this widespread use of the drug encourages its administration without complete regard for the indications and contraindications. According to Useful Drugs:[1]

> It is of great value as a prophylactic in operations on the urinary organs. It is valuable in cystitis, pyelitis, etc. It is employed as a prophylactic in the bacilluria of typhoid fever. Some advocate its routine use to prevent the occurrence of this complication. It has been recommended to prevent the onset of nephritis in scarlet fever. As it has produced albuminuria and hematuria in some cases, it should be used with caution in cases in which inflammation of the kidney is present or anticipated.

It is evident, then, that there is something contradictory in the recommendation of the use of this drug to prevent the onset of nephritis and the statement that it has produced an albuminuria and hematuria in some cases. Confirmatory evidence is offered by Dr. I. A. Abt,[2] who says in a discussion on pyelitis in infancy:

> Of the various drugs that have been recommended, hexamethylenetetramin (urotropin) has probably been most generally used. I would, however, recommend a word of caution concerning its use. It should be under continuous observation and its use should not be continued for an extended period. The urine should be frequently examined for blood. I have more than once seen severe and fatal nephritis which in my opinion was due to the overuse of urotropin. If urotropin is given to infants under 1 year of age it should be administered in 1-grain doses followed by water. This may be repeated four or five times daily.

* Owing to lack of space, the article on "Disturbances of the Kidneys" is omitted from this issue of THE JOURNAL. It will appear next week.

1. Useful Drugs, Chicago, American Medical Association, 1916, page 77.
2. Abt, I. A.: Pyelitis, Medical Clinics of Chicago, 1917, **2**, 904.

STATE BOARD STATISTICS FOR 1916

ANNUAL PRESENTATION BY THE COUNCIL ON MEDICAL EDUCATION OF RESULTS OF STATE BOARD EXAMINATIONS

On pages 1102 to 1111 are three tables, A, B and C, giving in detail the results of the various state medical license examinations held during 1916. Full reports were obtained from all state licensing boards and were carefully verified.

Tables A and B, when read from left to right, show (*a*) the number of graduates appearing for examination in each state, (*b*) whether they passed or failed, (*c*) the total number examined during the year, (*d*) the number who passed, (*e*) the number who failed, (*f*) the percentage of failures, and (*g*) the number of states in which graduates of each school appeared for examination. Read from above downward, they give the results by states, showing (*h*) the number registered and rejected from each college, (*i*) the total number examined, (*j*) the total number registered, (*k*) the total number rejected, and (*l*) the percentage of rejections. The fact that the majority of graduates take the license examination in the state in which the college is located is shown by the dark diagonal zone made by the grouping of figures passing from the upper left to the lower right corner of each table. This shows also that *the states in which low-grade medical schools are permitted to exist are themselves the recipients of the greater portion of the ill-trained output of such schools.* These tables are worthy of careful study, since important deductions are possible. The marginal numbers will enable one to follow readily the line for any college.

Caution in Forming Conclusions

In making comparisons on the basis of these statistics, several factors should be kept in mind. The number examined is important, since, if all other conditions are equal, the larger the number of graduates examined, the more accurate is the finding. But other conditions are seldom equal. The number of states in which a school's graduates have been examined is important. The larger this number the more accurate will be the conclusions. Again, the character of the board making the examination and the methods employed are important factors to be considered, since some boards hold very careful examinations and include practical laboratory and clinical tests, or they may mark the papers more severely; while others, especially partisan boards, may be very lenient. In this connection it should be stated that, although conditions are undergoing a steady improvement, it is still true that *the character of the license examination as usually conducted is such that graduates of colleges conducted largely by quiz-class methods may easily be successful in passing it.* It is particularly important, in forming conclusions based on these statistics, to note for each college the states in which its graduates are not admitted to examination—information set forth with these statistics in Table D.

Graduates of All Years Examined in 1916

Table A shows the results for all candidates who took examinations in 1916, regardless of the years in which they graduated. This shows that altogether 4,850 candidates were examined last year, as compared with 5,313 in 1915, 5,570 in 1914, 6,435 in 1913, and 6,879 in 1912. There has been a steady decrease each year since 1906, when 8,035 physicians were examined. The decrease each year has been due largely to (*a*) the wider extension of reciprocity and (*b*) the general diminution in the number of medical colleges, students and graduates. Of those examined this year, only 15 per cent. failed, as compared with 15.6 per cent. in 1915, 21.6 per cent. in 1914, 18.6 per cent. in 1913, and 20.5 per cent. in 1912. This indicates improved medical teaching, since there is no reason to believe that methods of examination have been relaxed.

There were 89 medical colleges in the United States granting degrees in 1916 which had graduates examined, as compared with 93 in 1915, 96 in 1914, 99 in 1913 and 110 in 1912. This is a decrease of 64 since 1905, when 153 medical colleges in the United States had graduates examined. The figures regarding graduates of several medical schools which have ceased to exist, either through merger or otherwise, have been included in the line for miscellaneous colleges.

Foreign graduates were examined in twenty-one states, the total number being 78, and of this number 35, or 44.9 per cent., failed. The largest number of foreigners examined in any state was 15 in New York, where 11, or 73.3 per cent., failed. Graduates of Canadian schools were examined in twenty-two states, more appearing, naturally, in the borderline states. The figures for the Canadian colleges are given separately in order to show the number of candidates coming from each, and to show the successes of their graduates at the examinations. Altogether 48 candidates from Canadian colleges were examined, of whom 9, or 18.7 per cent., failed. Of all Canadian colleges, the University of Toronto had the largest number examined. The highest percentages of failures were for Laval University, 60, Queen's University, 33.3, and Western University, 25.

No Undergraduates Examined During 1916

This is the first year, since the tabulation of these statistics was begun, in which no undergraduates were examined. The number examined each year has been constantly diminishing since 1906, when 703 undergraduates were examined and 342 were licensed. Colorado is now the only state which will examine nongraduates, but only four have been licensed in that state in ten years. The door has been closed, therefore, against the admission to practice of those whose medical training is known to be incomplete.

Recent Graduates Examined During 1916

Table B gives the results for graduates of 1912 to 1916 inclusive examined during 1916. This table is important, since it deals with recent graduates, and is, therefore, the fairest basis for comparison between colleges. Of all candidates examined in 1916, 4,283, or 88.3 per cent., were recent graduates, and of this number 12.7 per cent. failed, as compared with 15 per cent. for all candidates.

Old Practitioners Examined During 1916

Table C is so arranged as to show in comparison the results for graduates of all years (first column), for recent graduates (second column), for graduates of 1911 and previous years (third column), and for graduates of 1916 (fourth column). Of the graduates of 1911 and previous years—"old practitioners"—567 were examined, and of this number 182, or 32.1 per cent., failed, as compared with 12.7 per cent. of failures for recent graduates. This high percentage of failures is due largely to the long time these candidates have been out of college and to the fact that they are required to take the same examination as recent graduates. The less favorable conditions in medical colleges at the time many of these physicians graduated also, doubtless, have some bearing on this result. Justice to such physicians, who have been licensed, but who, for good reasons, desire to change their locations, is a strong argument for interstate reciprocity in medical licensure for the use of practical examinations by which they may show their skill in diagnosis and treatment, or for special percentage allowances for years of active practice. The total number of these candidates is diminishing each year as increased reciprocity relations are established. As a rule, the states which do not have reciprocal relations with other states (as Florida, Montana, Massachusetts, Oregon and Washington, see Table I) examined the largest numbers of old practitioners.

Graduates of 1916 Examined During 1916

Table C also gives the results for the graduates of 1916 who were examined during the year by the state boards, and

CONTINUED ON PAGE 1114

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 Dist. Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	ALABAMA																																												
1	University of Alabama, School of Medicine	16	1																	1	0	1	0													1	1									1
	ARKANSAS																																											
2	University of Arkansas, Medical Department					0	1	16	1																																	0	1			2
	CALIFORNIA																																											
3	College of Medical Evangelists									9	0																			1	0															3
4	College of Physicians and Surgeons, Los Angeles					2	0			23	0													1	0																					4
5	College of Physicians and Surgs. of San Francisco					1	0			6	1																																			5
6	Hahnemann Medical College of the Pacific.—H.									10	1																																			6
7	Leland Stanford Junior Univ., School of Medicine									22	0																																			7
8	Oakland College of Medicine and Surgery									2	0																																			8
9	University of California Medical School					2	0			31	0																																			9
	COLORADO																																												
10	University of Colorado, School of Medicine									1	0	12	0											1	0																					10
	CONNECTICUT																																												
11	Yale University, School of Medicine							1	0					5	1																											1	0			11
	DISTRICT OF COLUMBIA																																												
12	Georgetown University, School of Medicine			0	1							1	0	1	1			5	0									1	0											2	2	1	0	12
13	George Washington University Medical School					0	2			1	0			1	0			16	1																					1	0	2	0	1	0	13
14	Howard University, School of Medicine	0	1							1	0							1	3							2	1					2	0			1	0	1	0	1	1			14
	GEORGIA																																												
15	Atlanta Medical College	7	3																	19	2	58	1							1	0													15
16	Georgia College of Eclectic Med. and Surg.—E.							5	3																																			16
17	University of Georgia, Medical Department	1	0																	1	0	11	0																					17
	ILLINOIS																																												
18	Chicago College of Medicine and Surgery	0	2			1	0					1	0											1	0	138	20	3	0	6	0			1	0					0	1	3	2			18
19	Chicago Hospital College of Medicine																	1	0							3	6																			19
20	Hahnemann Medical College and Hospital.—H.							1	0	2	0															16	3			1	0	1	0											20
21	Jenner Medical College																									7	4																			21
22	Loyola University, School of Medicine	0	1			1	0	1	0	1	0			0	1					2	0	1	1			89	26			0	1			2	1	1	0			1	1	1	1			22
23	Northwestern University Medical School					2	0					1	0											2	0	40	2			6	0	1	0									2	0			23
24	Rush Medical College			1	0	3	0			5	0	2	0							0	1					79	2	1	0	9	0	1	0									2	0			24
25	University of Illinois, College of Medicine			1	0	2	0			1	0	0	1											2	0	98	1			5	0	1	0									2	0			25
	INDIANA																																												
26	Indiana University, School of Medicine																									1	0	33	2																	26
	IOWA																																												
27	State University of Iowa, College of Medicine																			1	0					3	0			22	0													27
28	State Univ. of Iowa, Coll. of Homeo. Med.—H.					1	0																																					28
	KANSAS																															11	0											
29	University of Kansas, School of Medicine																																												29
	KENTUCKY																																												
30	University of Louisville, Medical Department	1	0			0	1	1	0							1	0			0	1	1	0	1	0	2	2							39	2									30
	LOUISIANA																																												
31	Tulane University of Louisiana, School of Med.	9	0			1	0							1	0					5	0									1	0	2	0			51	0					1	0			31
	MAINE																																												
32	Bowdoin Medical School													1	0																							10	1			1	0			32
	MARYLAND																																												
33	Johns Hopkins University, Medical Department			1	0	1	0			3	0			0	1	1	0			1	0	1	0			2	0			2	0			1	0	1	0			37	2	4	0	1	0	33
34	Univ. of Maryland, Sch. of Med. & Coll. of P. & S.													1	1			2	1	1	0	2	0															1	0	41	14	7	1			34
	MASSACHUSETTS																																												
35	Boston University, School of Medicine.—H.									1	0															1	0											2	0			13	1			35
36	College of Physicians and Surgeons, Boston													0	2			0	1																							8	9			36
37	Medical School of Harvard University									3	0	1	0	8	2					1	0	2	0					2	0	4	0	1	0					2	0	1	0	32	0			37
38	Tufts College Medical School																	1	0					1	0					1	0							2	0			50	6			38
	MICHIGAN																																												
39	Detroit College of Medicine and Surgery																							1	0	1	1																	48	2	39
40	University of Michigan Medical School					1	0							0	1			1	0							1	0	1	0	1	0											1	0	55	0	40
41	University of Michigan, Homeo. Med. School.—H.									2	0																																	8	0	41
	MINNESOTA																																												
42	University of Minnesota Medical School					1	0																																							42
	MISSOURI																																												
43	Kansas City College of Medicine and Surgery.—E.							12	0																																			43
44	National University of Arts and Sciences											0	1											1	0	1	2							1	0									44
45	Southwest School of Medicine and Hospital.—H.							7	0																									6	0									45
46	St. Louis University, School of Medicine	0	1			1	0			2	0															16	0	2	0					2	0									46
47	Washington University Medical School					1	0													1	0																							47
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H. = Homeopathic; E. = Eclectic; P. = Passed; F. = Failed.

| Marginal Number | 23 Minnesota | | 24 Mississippi | | 25 Missouri | | 26 Montana | | 27 Nebraska | | 28 Nevada | | 29 New Hampshire | | 30 New Jersey | | 31 New Mexico | | 32 New York | | 33 North Carolina | | 34 North Dakota | | 35 Ohio | | 36 Oklahoma | | 37 Oregon | | 38 Pennsylvania | | 39 Rhode Island | | 40 South Carolina | | 41 South Dakota | | 42 Tennessee | | 43 Texas | | 44 Utah | | 45 Vermont | | 46 Virginia | | 47 Washington | | 48 West Virginia | | 49 Wisconsin | | 50 Wyoming | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Exam. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 Dist. Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	NEBRASKA																																												
48	John A. Creighton Medical College	..	..	..	..	1	0	..	..	0	1	1	1	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	2	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	48
49	Lincoln Medical College.—E.	..	..	..	..	..	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	49
50	University of Nebraska, College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50
	NEW HAMPSHIRE																																											
51	Dartmouth Medical School	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	0	..	..	51
	NEW YORK																																											
52	Albany Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	2	1	..	..	52
53	Columbia University	..	..	4	0	..	..	1	0	..	..	..	..	5	2	..	..	..	..	1	0	1	0	1	0	..	..	..	..	..	..	1	0	..	..	..	..	..	..	2	1	..	..	53
54	Cornell University Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	54
55	Fordham University, School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	55
56	Long Island College Hospital	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	56
57	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	1	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	1	..	..	57
58	New York Med. Coll. and Hosp. for Women.—H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	58
59	Syracuse University, College of Medicine	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	59
60	University and Bellevue Hospital Medical College	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	60
61	University of Buffalo Department of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	61
	NORTH CAROLINA																																											
62	North Carolina Medical College	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	62
	OHIO																																											
63	Eclectic Medical College.—E.	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	2	0	0	1	..	..	..	..	..	..	..	..	63
64	Ohio State University, College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	64
65	Ohio State University, Coll. of Homeo. Med.—H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	65
66	University of Cincinnati, College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	1	0	66
67	Western Reserve University, School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	67
	OKLAHOMA																																											
68	University of Oklahoma, School of Medicine	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	68
	OREGON																																											
69	University of Oregon, Department of Medicine	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	69
	PENNSYLVANIA																																											
70	Hahnemann Medical College and Hospital.—H.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	70
71	Jefferson Medical College	1	1	..	..	..	..	..	..	3	0	1	0	2	2	..	..	1	0	2	0	..	..	2	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	2	0	2	0	..	..	71
72	Medico-Chirurgical College of Philadelphia	..	..	..	..	..	..	..	..	..	..	..	..	2	0	4	0	0	1	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	0	1	1	0	72
73	Temple University, Department of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0	1	..	..	..	..	73
74	University of Pennsylvania, School of Medicine	..	..	..	..	..	..	..	..	2	0	2	0	..	..	3	0	..	..	2	0	..	..	..	..	2	1	..	..	2	0	..	..	2	0	..	..	..	..	..	..	2	0	..	..	74
75	University of Pittsburgh, School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	75
76	Woman's Medical College of Pennsylvania	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	3	0	..	..	76
	SOUTH CAROLINA																																											
77	Medical College of the State of South Carolina	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	77
	TENNESSEE																																											
78	Lincoln Memorial University, Medical Department	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	78
79	Meharry Medical College	3	6	..	..	..	..	2	4	..	..	..	..	..	..	..	..	0	4	6	4	7	4	..	..	4	8	..	..	..	..	..	..	7	2	2	1	..	..	..	..	..	..	..	..	79
80	University of Tennessee, College of Medicine	5	3	..	..	..	..	10	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	2	3	..	..	..	..	..	..	..	..	80
81	Univ. of West Tennessee, Coll. of Med. and Surg.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	81
82	Vanderbilt University, Medical Department	6	3	..	..	..	..	2	0	1	0	1	0	..	..	..	..	..	..	4	1	5	0	..	..	1	0	1	1	2	0	..	..	6	0	5	0	..	..	..	..	..	..	2	1	82
	TEXAS																																											
83	Baylor University, College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	83
84	Fort Worth School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	84
85	University of Texas, Department of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	85
	VERMONT																																											
86	University of Vermont, College of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	5	1	..	..	86
	VIRGINIA																																											
87	Medical College of Virginia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	1	0	87
88	University of Virginia, Department of Medicine	..	..	..	..	1	0	..	..	1	0	..	..	1	0	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	88
	WISCONSIN																																											
89	Marquette University, School of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	1	0	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	89
	CANADA																																											
90	Dalhousie University, Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	90
91	Laval University, Faculty of Medicine	..	..	..	..	..	..	..	..	0	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	0	1	..	..	91
92	McGill University, Faculty of Medicine	..	..	..	..	1	0	..	..	3	0	..	..	1	0	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	0	..	..	92
93	Montreal School of Medicine and Surgery	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	93
94	Queen's University, Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	94
95	University of Toronto, Faculty of Medicine	..	..	..	..	..	..	..	..	1	0	..	..	1	0	..	..	..	..	..	..	..	..	..	..	2	0	2	0	..	..	..	..	..	..	..	..	1	0	1	0	..	..	2	0	95
96	Western University, Faculty of Medicine	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	96
97	Foreign Colleges	..	..	1	0	5	2	..	..	3	2	..	..	1	0	0	1	3	0	3	0	..	..	..	..	1	5	1	0	1	0	..	..	..	..	..	..	..	..	2	0	3	4	1	0	97
98	Miscellaneous Medical Colleges	5	14	1	0	4	3	6	2	3	2	0	1	4	4	..	..	1	2	9	9	1	1	8	0	2	7	1	1	5	1	..	0	3	5	1	4	2	1	5	9	11	8	0	1	98
	Totals by States	91		12		42		78		154		33		61		15		47		86		140		29		608		53		84		33		76		78		27		126		206		140		
	Totals—Examined—Passed	55		11		33		67		146		25		41		13		33		68		133		29		517		49		82		32		66		68		25		96		166		135		
	Totals—Examined—Failed	36		1		9		11		8		8		20		2		14		18		7		0		91		4		2		1		10		10		2		30		40		5		
	Percentage of Failures	39.6		8.3		21.4		14.1		5.2		24.2		32.8		13.3		29.8		20.9		5.0		0.0		15.0		7.5		2.4		3.0		13.2		12.8		7.4		23.8		19.4		3.6		
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H. = Homeopathic; E. = Eclectic; P. = Passed; F. = Failed.

| Marginal Number | 23 Minnesota | | 24 Mississippi | | 25 Missouri | | 26 Montana | | 27 Nebraska | | 28 Nevada | | 29 New Hampshire | | 30 New Jersey | | 31 New Mexico | | 32 New York | | 33 North Carolina | | 34 North Dakota | | 35 Ohio | | 36 Oklahoma | | 37 Oregon | | 38 Pennsylvania | | 39 Rhode Island | | 40 South Carolina | | 41 South Dakota | | 42 Tennessee | | 43 Texas | | 44 Utah | | 45 Vermont | | 46 Virginia | | 47 Washington | | 48 West Virginia | | 49 Wisconsin | | 50 Wyoming | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Exam. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	1 Alabama		2 Alaska		3 Arizona		4 Arkansas		5 California		6 Colorado		7 Connecticut		8 Delaware		9 Dist. Columbia		10 Florida		11 Georgia		12 Idaho		13 Illinois		14 Indiana		15 Iowa		16 Kansas		17 Kentucky		18 Louisiana		19 Maine		20 Maryland		21 Massachusetts		22 Michigan		Marginal Number
		P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	P	F	
	ALABAMA																																												
1	University of Alabama, School of Medicine	16	1																																											1
	ARKANSAS																																												
2	University of Arkansas, Medical Department							16	1																																					2
	CALIFORNIA																																												
3	College of Medical Evangelists									9	0																			1	0															3
4	College of Physicians and Surgeons, Los Angeles					2	0			23	0																																			4
5	College of Physicians and Surgs. of San Francisco					1	0			5	1																																			5
6	Hahnemann Medical College of the Pacific.—H.									10	1																																			6
7	Leland Stanford Junior Univ., School of Medicine									22	0																																			7
8	Oakland College of Medicine and Surgery									2	0																																			8
9	University of California Medical School					2	0			30	0																																			9
	COLORADO																																												
10	University of Colorado, School of Medicine									1	0	11	0																																	10
	CONNECTICUT																																												
11	Yale University, School of Medicine													5	1																													1	0	11
	DISTRICT OF COLUMBIA																																												
12	Georgetown University, School of Medicine											1	0	1	0			4	0											1	0											2	1	1	0	12
13	George Washington University Medical School									1	0			1	0			14	1																							1	0	1	0	1	0	13
14	Howard University, School of Medicine	0	1							1	0							1	2							2	1					2	0			1	0			1	0					14
	GEORGIA																																												
15	Atlanta Medical College	7	3																	17	2	97	0							1	0															15
16	Georgia College of Eclectic Med. and Surg.—E.							5	3																																					16
17	University of Georgia, Medical Department	1	0																	1	0	11	0																							17
	ILLINOIS																																												
18	Chicago College of Medicine and Surgery	9	1			1	0					1	0											1	0	138	20	3	0	5	0			1	0					0	1	3	1			18
19	Chicago Hospital College of Medicine																	1	0							3	6																			19
20	Hahnemann Medical College and Hospital.—H.									2	0															16	3			1	0	1	0													20
21	Jenner Medical College																									7	4																			21
22	Loyola University, School of Medicine	9	1			1	0	1	0	1	0			0	1					2	0	1	1			80	26							2	2	1	0			1	1	1	1			22
23	Northwestern University Medical School					1	0					1	0											1	0	39	2			3	0	1	0									2	0	23
24	Rush Medical College					2	0			5	0	2	0													77	1	1	0	7	0	1	0									2	0	24
25	University of Illinois, College of Medicine					1	0			1	0													2	0	96	1			5	0	1	0									2	0	25
	INDIANA																																												
26	Indiana University, School of Medicine																									1	0	33	2																	26
	IOWA																																												
27	State University of Iowa, College of Medicine																									1	0			27	0															27
28	State Univ. of Iowa, Coll. of Homeo. Med.—H.																																												28
	KANSAS																																												
29	University of Kansas, School of Medicine																															11	0											29
	KENTUCKY																																												
30	University of Louisville, Medical Department	1	0			0	1									1	0									2	1							38	2									30
	LOUISIANA																																												
31	Tulane University of Louisiana, School of Med.	7	0																	5	0									1	0	2	0			50	0							31
	MAINE																																												
32	Bowdoin Medical School													1	0																							10	1			1	0			32
	MARYLAND																																												
33	Johns Hopkins University, Medical Department									1	0					1	0					1	0			2	0			1	0			1	0	1	0			37	2	4	0	1	0	33
34	Univ. of Maryland, Sch. of Med. & Coll. of P. & S.													1	1			2	1	1	0	2	0													1	0	41	14	7	1			34
	MASSACHUSETTS																																												
35	Boston University, School of Medicine.—H.									1	0																											1	0			13	1			35
36	College of Physicians and Surgeons, Boston													0	1			0	1																							7	8			36
37	Medical School of Harvard University									3	0	1	0	7	2					1	0	2	0					2	0	3	0	1	0					2	0	1	0	32	0			37
38	Tufts College Medical School																													1	0					2	0			50	6			38
	MICHIGAN																																												
39	Detroit College of Medicine and Surgery																							1	0																			48	2	39
40	University of Michigan Medical School					1	0																					1	0													55	0	40
41	University of Michigan, Homeo. Med. School.—H.									2	0																																	8	0	41
	MINNESOTA																																												
42	University of Minnesota Medical School					1	0																																							42
	MISSOURI																																												
43	Kansas City College of Medicine and Surgery.—E.							12	0																																			43
44	National University of Arts and Sciences											0	1											1	0	1	2							1	0									44
45	Southwest School of Medicine and Hospital.—H.							7	0																									6	0									45
46	St. Louis University, School of Medicine	6	1							1	0															16	0	2	0					2	0									46
47	Washington University Medical School					1	0																																					47
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H. = Homeopathic; E. = Eclectic; P. = Passed; F. = Failed.

| Marginal Number | 23 | | 24 | | 25 | | 26 | | 27 | | 28 | | 29 | | 30 | | 31 | | 32 | | 33 | | 34 | | 35 | | 36 | | 37 | | 38 | | 39 | | 40 | | 41 | | 42 | | 43 | | 44 | | 45 | | 46 | | 47 | | 48 | | 49 | | 50 | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Exam. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	1 Alabama P	1 Alabama F	2 Alaska P	2 Alaska F	3 Arizona P	3 Arizona F	4 Arkansas P	4 Arkansas F	5 California P	5 California F	6 Colorado P	6 Colorado F	7 Connecticut P	7 Connecticut F	8 Delaware P	8 Delaware F	9 Dist. Columbia P	9 Dist. Columbia F	10 Florida P	10 Florida F	11 Georgia P	11 Georgia F	12 Idaho P	12 Idaho F	13 Illinois P	13 Illinois F	14 Indiana P	14 Indiana F	15 Iowa P	15 Iowa F	16 Kansas P	16 Kansas F	17 Kentucky P	17 Kentucky F	18 Louisiana P	18 Louisiana F	19 Maine P	19 Maine F	20 Maryland P	20 Maryland F	21 Massachusetts P	21 Massachusetts F	22 Michigan P	22 Michigan F	Marginal Number
	NEBRASKA																																														
48	John A. Creighton Medical College					1	0			0	1	1	0																	2	0	1	0															48
49	Lincoln Medical College.—E.											0	1																																			49
50	University of Nebraska, College of Medicine																																														50
	NEW HAMPSHIRE																																														
51	Dartmouth Medical School																																									1	0					51
	NEW YORK																																														
52	Albany Medical College																																									2	1					52
53	Columbia University			1	0			1	0					3	2							1	0									1	0									2	0			53
54	Cornell University Medical College																																														54
55	Fordham University, School of Medicine													1	0																																	55
56	Long Island College Hospital													1	1																													1	0			56
57	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.													1	0	2	1					1	0			1	0											1	0			1	1			57
58	New York Med. Coll. and Hosp. for Women.—H.																																														58
59	Syracuse University, College of Medicine																																														59
60	University and Bellevue Hospital Medical College																			1	0																					1	0			60
61	University of Buffalo Department of Medicine																																											2	0	61
	NORTH CAROLINA																																													
62	North Carolina Medical College																																														62
	OHIO																																														
63	Eclectic Medical College.—E.									2	0															1	0							2	0											63
64	Ohio State University, College of Medicine																									1	0																			64
65	Ohio State University, Coll. of Homeo. Med.—H.																																														65
66	University of Cincinnati, College of Medicine																																			1	0									1	0	66
67	Western Reserve University, School of Medicine																																														67
	OKLAHOMA																																														
68	University of Oklahoma, School of Medicine	1	0																																												68
	OREGON																																														
69	University of Oregon, Department of Medicine									1	0																																					69
	PENNSYLVANIA																																														
70	Hahnemann Medical College and Hospital.—H.															2	0																					1	0							70
71	Jefferson Medical College	1	1							5	0	1	0	2	2			1	0	2	0			2	0					1	0											2	0	2	0	71
72	Medico-Chirurgical College of Philadelphia													2	0	4	0	0	1																							1	0	0	1	1	0	72
73	Temple University, Department of Medicine													1	0			1	1																							0	1					73
74	University of Pennsylvania, School of Medicine									2	0	2	0			3	0			1	0									1	0			2	0							1	0			74
75	University of Pittsburgh, School of Medicine																																														75
76	Woman's Medical College of Pennsylvania																													1	0									1	0	2	0			76
	SOUTH CAROLINA																																														
77	Medical College of the State of South Carolina																			1	0																											77
	TENNESSEE																																														
78	Lincoln Memorial University, Medical Department							2	0																									1	0											78
79	Meharry Medical College	3	5					2	4									0	4	6	4	7	3			3	7							6	2	2	1									79
80	University of Tennessee, College of Medicine	5	3					10	1																											2	3									80
81	Univ. of West Tennessee, Coll. of Med. and Surg.																					1	0									0	1													81
82	Vanderbilt University, Medical Department	6	3					2	0	1	0	1	0							4	0	5	0			1	0	1	1	2	0			5	0	5	0							2	1	82
	TEXAS																																														
83	Baylor University, College of Medicine																																					1	0									83
84	Fort Worth School of Medicine																																														84
85	University of Texas, Department of Medicine																			2	0											1	0											1	0			85
	VERMONT																																														
86	University of Vermont, College of Medicine													2	0									1	0			1	0															4	1			86
	VIRGINIA																																														
87	Medical College of Virginia																																											4	1			87
88	University of Virginia, Department of Medicine					1	0																																							88
	WISCONSIN																																														
89	Marquette University, School of Medicine																							1	0	1	0	1	0																	80
	CANADA																																														
90	Dalhousie University, Faculty of Medicine																																											1	0			90
91	Laval University, Faculty of Medicine																																							1	0					91
92	McGill University, Faculty of Medicine									3	0			1	0																													1	0			92
93	Montreal School of Medicine and Surgery																																											1	0			93
94	Queen's University, Faculty of Medicine																																											1	0			94
95	University of Toronto, Faculty of Medicine																																							1	0					95
96	Western University, Faculty of Medicine																													1	0													2	0	96
97	Foreign Colleges					0	1									0	1	1	0	2	0					0	1	1	0													2	0	0	2			97
98	Miscellaneous Medical Colleges	5	12			0	1	0	1	3	1	0	1	3	4			0	1	1	2	1	0											2	1							4	6	7	6			98
	Totals by States	85		1		19		68		140		25		48		15		37		55		134		10		573		49		65		33		68		68		20		120		181		136	
	Totals—Examined—Passed	53		1		16		56		136		22		33		13		25		47		130		10		498		46		65		32		61		64		19		94		150		133	
	Totals—Examined—Failed	32		0		3		10		4		3		15		2		12		8		4		0		75		3		0		1		7		4		1		26		31		3	
	Percentage of Failures	37.6		0.0		15.8		14.7		2.9		12.0		31.2		13.3		32.4		14.5		3.0		0.0		13.1		6.1		0.0		3.0		10.3		5.9		5.0		21.7		17.1		2.2	
		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18		19		20		21		22		

H. = Homeopathic; E. = Eclectic; P. = Passed; F. = Failed.

| Marginal Number | 23 Minnesota | | 24 Mississippi | | 25 Missouri | | 26 Montana | | 27 Nebraska | | 28 Nevada | | 29 New Hampshire | | 30 New Jersey | | 31 New Mexico | | 32 New York | | 33 North Carolina | | 34 North Dakota | | 35 Ohio | | 36 Oklahoma | | 37 Oregon | | 38 Pennsylvania | | 39 Rhode Island | | 40 South Carolina | | 41 South Dakota | | 42 Tennessee | | 43 Texas | | 44 Utah | | 45 Vermont | | 46 Virginia | | 47 Washington | | 48 West Virginia | | 49 Wisconsin | | 50 Wyoming | | Totals | Examined—Passed | Examined—Failed | Percentage of Failures | No. States Exam. in | Marginal Number |
|---|---|---

Marginal Number	NAME OF COLLEGE	Graduates of All Years					Graduates of 1912-1916					Graduates of 1911 and Previous					Graduates of 1916					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	ALABAMA																					
1	University of Alabama, School of Medicine	26	21	5	19.2	6	18	16	2	11.1	2	8	5	3	37.5	6	15	14	1	6.7	1	1
	ARKANSAS																					
2	University of Arkansas, Medical Department	20	17	3	15.0	4	17	16	1	5.9	1	3	1	2	66.7	2	16	15	1	6.3	1	2
	CALIFORNIA																					
3	College of Medical Evangelists	13	13	0	0.0	4	13	13	0	0.0	4	...	...	...	.....	..	9	9	0	0.0	1	3
4	College of Physicians and Surgeons, Los Angeles	27	27	0	0.0	4	26	26	0	0.0	3	1	1	0	0.0	1	20	20	0	0.0	2	4
5	College of Physicians and Surgs. of San Francisco	10	8	2	20.0	3	9	7	2	22.2	3	1	1	0	0.0	1	5	4	1	20.0	3	5
6	Hahnemann Medical College of the Pacific.—H.	13	11	2	15.4	3	13	11	2	15.4	3	...	...	...	.....	..	12	11	1	8.3	3	6
7	Leland Stanford Junior Univ., School of Medicine	25	25	0	0.0	4	25	25	0	0.0	4	...	...	...	.....	..	20	20	0	0.0	1	7
8	Oakland College of Medicine and Surgery	2	2	0	0.0	1	2	2	0	0.0	1	...	...	...	.....	..	2	2	0	0.0	1	8
9	University of California Medical School	35	35	0	0.0	3	33	33	0	0.0	3	2	2	0	0.0	2	30	30	0	0.0	2	9
	COLORADO																					
10	University of Colorado, School of Medicine	18	18	0	0.0	6	15	15	0	0.0	5	3	3	0	0.0	3	12	12	0	0.0	2	10
	CONNECTICUT																					
11	Yale University, School of Medicine	12	11	1	8.3	6	11	10	1	9.1	5	1	1	0	0.0	1	6	6	0	0.0	3	11
	DISTRICT OF COLUMBIA																					
12	Georgetown University, School of Medicine	25	21	4	16.0	13	20	19	1	5.0	11	5	2	3	60.0	5	2	2	0	0.0	2	12
13	George Washington University Medical School	33	29	4	12.1	14	24	22	2	8.3	10	9	7	2	22.2	7	18	16	2	11.1	5	13
14	Howard University, School of Medicine	29	19	10	34.5	15	24	17	7	29.2	14	5	2	3	60.0	5	5	4	1	20.0	5	14
	GEORGIA																					
15	Atlanta Medical College	157	142	15	9.6	12	149	135	14	9.4	11	8	7	1	12.5	6	129	123	6	4.7	7	15
16	Georgia College of Eclectic Med. and Surg.—E.	9	6	3	33.3	2	9	6	3	33.3	2	..	...	...	.....	..	8	5	3	37.5	1	16
17	University of Georgia, Medical Department	19	18	1	5.3	7	19	18	1	5.3	7	...	...	...	.....	..	15	15	0	0.0	5	17
	ILLINOIS																					
18	Chicago College of Medicine and Surgery	225	190	35	15.5	27	220	188	32	14.5	27	5	2	3	60.0	5	160	141	19	11.9	16	18
19	Chicago Hospital College of Medicine	10	4	6	60.0	2	10	4	6	60.0	2	...	...	...	.....	..	3	2	1	33.3	1	19
20	Hahnemann Medical College and Hospital.—H.	29	26	3	10.3	9	25	22	3	12.0	6	4	4	0	0.0	4	18	17	1	5.6	4	20
21	Jenner Medical College	12	8	4	33.3	2	12	8	4	33.3	2	...	...	...	.....	..	6	4	2	33.3	1	21
22	Loyola University, School of Medicine	163	125	38	23.3	24	157	121	36	22.9	22	6	4	2	33.3	5	107	84	23	21.5	14	22
23	Northwestern University Medical School	67	62	5	7.5	15	57	54	3	5.3	13	10	8	2	20.0	7	43	41	2	4.7	7	23
24	Rush Medical College	145	137	8	5.5	24	123	121	2	1.6	18	22	16	6	27.3	13	86	84	2	2.3	13	24
25	University of Illinois, College of Medicine	143	139	4	2.8	21	130	128	2	1.5	18	13	11	2	15.4	6	111	110	1	0.9	9	25
	INDIANA																					
26	Indiana University, School of Medicine	37	35	2	5.4	3	36	34	2	5.6	2	1	1	0	0.0	1	35	33	2	5.7	2	26
	IOWA																					
27	State Universtiy of Iowa, College of Medicine	35	34	1	2.9	4	28	28	0	0.0	2	7	6	1	14.3	4	28	28	0	0.0	2	27
28	State Univ. of Iowa, Coll. of Homeo. Med.—H.	1	1	0	0.0	1	....	....	....	....	..	1	1	0	0.0	1	....	....	...	....	..	28
	KANSAS																					
29	University of Kansas, School of Medicine	11	11	0	0.0	1	11	11	0	0.0	1	...	...	...	.....	..	11	11	0	0.0	1	29
	KENTUCKY																					
30	University of Louisville, Medical Department	79	67	12	15.2	23	67	59	8	11.9	16	12	8	4	33.3	12	53	50	3	5.7	10	30
	LOUISIANA																					
31	Tulane University of Louisiana, School of Med.	97	92	5	5.2	17	86	82	4	4.7	12	11	10	1	9.1	10	78	76	2	2.6	10	31
	MAINE																					
32	Bowdoin Medical School	13	12	1	7.7	3	13	12	1	7.7	3	...	...	...	.....	..	10	9	1	10.0	1	32
	MARYLAND																					
33	Johns Hopkins University, Medical Department	103	96	7	6.8	29	87	83	4	4.6	25	16	13	3	18.7	9	47	45	2	4.3	10	33
34	Univ. of Maryland, Sch. of Med. & Coll. of P. & S.	125	104	21	16.8	17	123	102	21	17.1	17	2	2	0	0.0	2	83	67	16	19.3	12	34
	MASSACHUSETTS																					
35	Boston University, School of Medicine.—H.	25	23	2	8.0	8	23	21	2	8.7	7	2	2	0	0.0	2	12	12	0	0.0	3	35
36	College of Physicians and Surgeons, Boston	21	8	13	61.9	4	17	7	10	58.8	3	4	1	3	75.0	3	13	6	7	53.8	2	36
37	Medical School of Harvard University	99	92	7	7.1	26	92	88	4	4.3	25	7	4	3	42.9	5	47	45	2	4.3	15	37
38	Tufts College Medical School	86	74	12	13.9	11	80	70	10	12.5	9	6	4	2	33.3	4	56	53	3	5.4	5	38
	MICHIGAN																					
39	Detroit College of Medicine and Surgery	57	53	4	7.0	5	52	50	2	3.8	3	5	3	2	40.0	3	50	48	2	4.0	1	39
40	University of Michigan Medical School	76	72	4	5.3	17	65	63	2	3.1	10	11	9	2	18.2	11	62	61	1	1.6	8	40
41	University of Michigan, Homeo. Med. School.—H.	11	11	0	0.0	3	11	11	0	0.0	3	..	...	...	.....	..	7	7	0	0.0	1	41
	MINNESOTA																					
42	University of Minnesota Medical School	42	42	0	0.0	7	38	38	0	0.0	6	4	4	0	0.0	3	34	34	0	0.0	2	42
	MISSOURI																					
43	Kansas City College of Medicine and Surgery.—E.	12	12	0	0.0	1	12	12	0	0.0	1	...	...	...	.....	..	12	12	0	0.0	1	43
44	National University of Arts and Sciences	67	59	8	11.9	7	67	59	8	11.9	7	...	...	...	.....	..	61	55	6	9.8	5	44
45	Southwest School of Medicine and Hospital.—H.	13	13	0	0.0	2	13	13	0	0.0	2	...	...	...	.....	..	13	13	0	0.0	2	45
46	St. Louis University, School of Medicine	64	63	1	1.6	11	61	60	1	1.6	9	3	3	0	0.0	3	50	50	0	0.0	6	46
47	Washington University Medical School	19	19	0	0.0	6	18	18	0	0.0	5	1	1	0	0.0	1	18	16	0	0.0	4	47

H. = Homeopathic; E. = Eclectic.

Marginal Number	NAME OF COLLEGE	Graduates of All Years					Graduates of 1912-1916					Graduates of 1911 and Previous					Graduates of 1916					Marginal Number
		Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	Number Examined	Number Passed	Number Failed	Per Cent. Failed	Number of States	
	NEBRASKA																					
48	John A. Creighton Medical College	53	50	3	5.7	12	51	49	2	3.9	11	2	1	1	50.0	2	41	41	0	0.0	4	48
49	Lincoln Medical College.—E.	8	5	3	37.5	2	3	[illegible]	1	33.3	2	5	3	2	40.0	2	5	3	2	40.0	2	49
50	University of Nebraska, College of Medicine	3	3	0	0.0	2	3	3	0	0.0	2	...	...	...	.....	..	2	2	0	0.0	1	50
	NEW HAMPSHIRE																					
51	Dartmouth Medical School	6	6	0	0.0	4	1	1	0	0.0	1	5	5	0	0.0	4	.....	.....	...	.....	..	51
	NEW YORK																					
52	Albany Medical College	77	61	16	20.8	7	73	59	14	19.2	6	4	2	2	50.0	2	38	36	2	5.3	2	52
53	Columbia University	95	82	13	13.7	17	83	71	12	14.5	12	12	11	1	8.3	8	36	34	2	5.6	5	53
54	Cornell University Medical College	27	27	0	0.0	2	25	25	0	0.0	1	2	2	0	0.0	1	19	19	0	0.0	1	54
55	Fordham University, School of Medicine	52	38	14	26.9	4	52	38	14	26.9	4	...	...	...	.....	..	24	17	7	29.2	1	55
56	Long Island College Hospital	95	91	4	4.2	5	93	89	4	4.3	5	2	2	0	0.0	2	76	74	2	2.6	2	56
57	N. Y. Homeo. Med. Coll. and Flower Hosp.—H.	94	62	32	34.0	11	92	60	32	34.8	9	2	2	0	0.0	2	34	23	11	32.4	4	57
58	New York Med. Coll. and Hosp. for Women.—H.	15	8	7	46.7	1	15	8	7	46.7	1	...	...	...	.....	..	11	6	5	45.5	1	58
59	Syracuse University, College of Medicine	27	27	0	0.0	4	25	25	0	0.0	2	2	2	0	0.0	2	18	18	0	0.0	1	59
60	University and Bellevue Hospital Medical College	68	63	5	7.3	7	63	59	4	6.3	5	5	1	1	20.0	3	35	32	3	8.6	3	60
61	University of Buffalo Department of Medicine	45	39	6	13.3	2	44	39	5	11.4	2	1	0	1	100.0	1	36	34	2	5.6	2	61
	NORTH CAROLINA																					
62	North Carolina Medical College	22	15	7	31.8	5	20	15	5	25.0	4	2	0	2	100.0	2	8	8	0	0.0	1	62
	OHIO																					
63	Eclectic Medical College.—E.	33	28	5	15.2	9	29	26	3	10.3	7	4	2	2	50.0	3	26	24	2	7.7	6	63
64	Ohio State University, College of Medicine	67	66	1	1.5	5	67	66	1	1.5	5	...	...	...	.....	..	65	65	0	0.0	4	64
65	Ohio State University, Coll. of Homeo. Med.—H.	7	7	0	0.0	1	7	7	0	0.0	1	...	...	...	.....	..	7	7	0	0.0	1	65
66	University of Cincinnati, College of Medicine	28	28	0	0.0	7	24	24	0	0.0	4	4	4	0	0.0	3	24	24	0	0.0	4	66
67	Western Reserve University, School of Medicine	59	59	0	0.0	6	58	58	0	0.0	5	1	1	0	0.0	1	53	53	0	0.0	2	67
	OKLAHOMA																					
68	University of Oklahoma, School of Medicine	20	16	4	20.0	6	19	16	3	15.8	5	1	0	1	100.0	1	13	12	1	7.7	2	68
	OREGON																					
69	University of Oregon, Department of Medicine	23	21	2	8.7	5	19	17	2	10.5	4	4	4	0	0.0	3	12	10	2	16.7	3	69
	PENNSYLVANIA																					
70	Hahnemann Medical College and Hospital.—H.	21	21	0	0.0	6	21	21	0	0.0	6	...	...	...	.....	..	4	4	0	0.0	3	70
71	Jefferson Medical College	174	161	13	7.5	27	167	156	11	6.6	27	7	5	2	28.6	5	45	45	0	0.0	17	71
72	Medico-Chirurgical College of Philadelphia	90	74	16	17.8	16	89	73	16	18.0	15	1	1	0	0.0	1	14	12	2	14.3	7	72
73	Temple University, Department of Medicine	24	19	5	20.8	5	23	18	5	21.8	4	1	1	0	0.0	1	.....	.....	...	.....	..	73
74	University of Pennsylvania, School of Medicine	72	69	3	4.2	20	62	61	1	1.6	18	10	8	2	20.0	7	19	19	0	0.0	9	74
75	University of Pittsburgh, School of Medicine	15	15	0	0.0	5	14	14	0	0.0	4	1	1	0	0.0	1	.....	.....	...	.....	..	75
76	Woman's Medical College of Pennsylvania	27	22	5	18.5	9	22	18	4	18.2	7	5	4	1	20.0	5	3	3	0	0.0	2	76
	SOUTH CAROLINA																					
77	Medical College of the State of South Carolina	24	19	5	20.8	3	19	19	0	0.0	3	5	0	5	100.0	2	18	18	0	0.0	3	77
	TENNESSEE																					
78	Lincoln Memorial University, Medical Department	15	14	1	6.7	5	15	14	1	6.7	5	...	...	...	.....	..	14	13	1	7.2	5	78
79	Meharry Medical College	148	81	67	45.3	20	139	78	61	43.9	18	9	3	6	66.7	7	87	61	26	29.9	13	79
80	University of Tennessee, College of Medicine	83	67	16	19.3	10	81	66	15	18.5	8	2	1	1	50.0	2	63	53	10	15.9	7	80
81	Univ. of West Tennessee, Coll. of Med. and Surg.	28	10	18	64.3	9	27	10	17	63.0	9	1	0	1	100.0	1	6	3	3	50.0	2	81
82	Vanderbilt University, Medical Department	111	105	6	5.4	18	109	104	5	4.6	18	2	1	1	50.0	2	83	83	0	0.0	10	82
	TEXAS																					
83	Baylor University, College of Medicine	29	24	5	17.2	4	27	22	5	18.5	3	2	2	0	0.0	2	26	21	5	19.2	2	83
84	Fort Worth School of Medicine	7	6	1	14.3	2	7	6	1	14.3	2	...	...	...	.....	..	6	5	1	16.7	2	84
85	University of Texas, Department of Medicine	37	37	0	0.0	7	37	37	0	0.0	7	...	...	...	.....	..	30	30	0	0.0	3	85
	VERMONT																					
86	University of Vermont, College of Medicine	39	34	5	12.8	9	34	31	3	8.8	8	5	3	2	40.0	4	9	9	0	0.0	3	86
	VIRGINIA																					
87	Medical College of Virginia	124	113	11	8.9	11	122	111	11	9.0	10	2	2	0	0.0	2	91	86	5	5.5	6	87
88	University of Virginia, Department of Medicine	25	25	0	0.0	11	20	20	0	0.0	7	5	5	0	0.0	5	16	16	0	0.0	4	88
	WISCONSIN																					
89	Marquette University, School of Medicine	53	52	1	1.9	8	53	52	1	1.9	8	...	...	...	.....	..	46	46	0	0.0	2	89
	CANADA																					
90	Dalhousie University, Faculty of Medicine	1	1	0	0.0	1	1	1	0	0.0	1	...	...	...	.....	..	.....	.....	...	.....	..	90
91	Laval University, Faculty of Medicine	5	2	3	60.0	5	3	2	1	33.3	3	2	0	2	100.0	2	1	1	0	0.0	1	91
92	McGill University, Faculty of Medicine	16	13	3	18.7	10	10	9	1	10.0	7	6	4	2	33.3	5	1	1	0	0.0	1	92
93	Montreal School of Medicine and Surgery	2	2	0	0.0	2	2	2	0	0.0	2	...	...	...	.....	..	.....	.....	...	.....	..	93
94	Queen's University, Faculty of Medicine	3	2	1	33.3	3	2	1	1	50.0	2	1	1	0	0.0	1	.....	.....	...	.....	..	94
95	University of Toronto, Faculty of Medicine	17	16	1	5.9	12	8	7	1	12.5	5	9	9	0	0.0	7	1	1	0	0.0	1	95
96	Western University, Faculty of Medicine	4	3	1	25.0	4	4	3	1	25.0	4	...	...	...	.....	..	.....	.....	...	.....	..	96
97	Foreign Colleges	78	43	35	44.9	21	19	7	12	63.2	12	59	36	23	39.0	18	.....	.....	...	.....	..	97
98	Miscellaneous Medical Colleges	294	164	130	44.2	44	119	60	59	49.6	31	175	104	71	40.6	42	2	2	0	0.0	1	98
	Totals	4850	4123	727	15.0	..	4283	3738	545	12.7	..	567	385	182	32 1	..	2804	2596	208	7.4		

TABLE D.—NONRECOGNITION OF MEDICAL COLLEGES

This Table, Based on Official Reports, Shows the Numerous Pitfalls to be Avoided by Prospective Medical Students

The meaning of the letters (**a, b, c, d, x**) is given in the footnotes.

| Marginal Number | COLLEGE | Classification by Council on Medical Education† | 1 Alabama | 2 Alaska | 3 Arizona | 4 Arkansas | 5 California | 6 Colorado | 7 Connecticut | 8 Delaware | 9 Dist. of Columbia | 10 Florida | 11 Georgia | 12 Idaho | 13 Illinois | 14 Indiana | 15 Iowa | 16 Kansas | 17 Kentucky | 18 Louisiana | 19 Maine | 20 Maryland | 21 Massachusetts | 22 Michigan | 23 Minnesota | 24 Mississippi | 25 Missouri | 26 Montana | 27 Nebraska | 28 Nevada | 29 New Hampshire | 30 New Jersey | 31 New Mexico | 32 New York | 33 North Carolina | 34 North Dakota | 35 Ohio | 36 Oklahoma | 37 Oregon | 38 Pennsylvania | 39 Rhode Island | 40 South Carolina | 41 South Dakota | 42 Tennessee | 43 Texas | 44 Utah | 45 Vermont | 46 Virginia | 47 Washington | 48 West Virginia | 49 Wisconsin | 50 Wyoming | 51 Porto Rico | Reported Non-Recognition by State Licensing Boards: No. of State Boards apparently giving full recognition | No. of State Boards reporting college diplomas not fully recognized | Percentage of State Boards granting full recognition | Marginal Number |
|---|---|---

| | | |

CONCLUDED FROM PAGE 1101

shows that 2,804, or 57.8 per cent., of all candidates examined during the year graduated in 1916, including three who graduated from Canadian medical colleges. Educational statistics show that the medical colleges of the United States graduated 3,518 students last year; therefore, 79.7 per cent. of all graduates in 1916 took examinations for license during that year. In some of the states, graduates in medicine are allowed to serve as hospital interns without first becoming licensed practitioners, which doubtless accounts for some of the remaining 20.3 per cent. Of the 1916 graduates examined, 208, or 7.4 per cent., failed.

TABLE E.—COLLEGES GROUPED BY STATES
Showing the Number Examined and Percentage of Failures

All Colleges of	Graduates								According to Number Examined	According to Successes at Examinations
	Of All Years		Of 1912 to 1916		Of 1911 & Prev.		Of 1916			
	No. Examined	Per Cent. Failed	No. Examined	Per Cent. Failed	No. Examined	Per Cent. Failed	No. Examined	Per Cent. Failed	State Rank	Rank
Alabama	26	19.2	18	11.1	8	37.5	15	6.7	23	25
Arkansas	20	15.0	17	5.9	3	66.7	16	6.3	27	21
California	125	3.2	121	3.3	4	0.0	98	2.0	12	5
Colorado	18	0.0	15	0.0	3	0.0	12	0.0	28	1
Connecticut	12	8.3	11	9.1	1	0.0	6	0.0	30	13
Dist. of Columbia	87	20.7	68	14.7	19	42.1	25	12.0	14	27
Georgia	185	10.3	177	10.2	8	12.5	152	5.9	8	17
Illinois	794	13.0	734	10.6	60	25.0	534	9.6	1	20
Indiana	37	5.7	36	5.6	1	0.0	35	5.7	21	9
Iowa	36	2.8	28	0.0	8	12.5	28	0.0	22	3
Kansas	11	0.0	11	0.0	.....	.....	11	0.0	31	1
Kentucky	79	15.2	67	11.9	12	33.3	53	5.7	15	22
Louisiana	97	5.2	86	4.7	11	9.1	78	2.6	13	7
Maine	13	7.7	13	7.7	.....	.....	10	10.0	29	11
Maryland	228	12.3	210	11.9	18	16.7	130	13.8	6	18
Massachusetts	231	15.4	212	12.3	19	42.1	128	9.4	5	23
Michigan	144	5.6	128	3.1	16	25.0	119	2.5	11	8
Minnesota	42	0.0	38	0.0	4	0.0	34	0.0	19	1
Missouri	175	5.1	171	5.3	4	0.0	152	3.9	9	6
Nebraska	64	9.4	57	5.3	7	42.9	48	4.2	17	15
New Hampshire	6	0.0	1	0.0	5	0.0	.....	.....	32	1
New York	595	16.3	565	16.3	30	16.7	327	10.4	2	24
North Carolina	22	31.8	20	25.0	2	100.0	8	0.0	26	30
Ohio	194	3.1	185	2.2	9	22.2	175	1.1	7	4
Oklahoma	20	20.0	19	15.8	1	100.0	13	7.7	27	26
Oregon	23	8.7	19	10.5	4	0.0	12	16.7	25	14
Pennsylvania	423	9.9	398	9.3	25	20.0	85	2.4	3	16
South Carolina	24	20.8	19	0.0	5	100.0	18	0.0	24	28
Tennessee	385	28.1	371	26.7	14	64.3	253	15.8	4	29
Texas	73	8.2	71	8.5	2	0.0	62	9.7	16	12
Vermont	39	12.8	34	8.8	5	40.0	9	0.0	20	19
Virginia	149	7.4	142	7.7	7	0.0	107	4.7	10	10
Wisconsin	53	1.9	53	1.9	.....	.....	46	0.0	18	2
Totals Ex. in 1916	4430	12.5	4115	11.4	315	26.7	2799	7.4	....	....

This table gives data relating to the group of colleges in each state. For example, it shows that, of all the medical schools in Tennessee, 385 graduates of various years were examined by state boards during 1916, and of this number, 28.1 per cent. failed. Of the 371 who graduated in recent years (1912 to 1916 inclusive), 26.7 per cent. failed; of the 14 who graduated previous to 1912, 64.3 per cent. failed, and of the 253 graduates of 1916, 15.8 per cent. failed.

The ninth column gives the rank of each state group of colleges according to the number of graduates examined. The Illinois group of colleges leads, having 794 graduates examined by state boards during 1916, followed by New York with 595, Pennsylvania with 423, Tennessee with 385, Massachusetts with 231 and Maryland with 228.

The last column gives the rank of each state group of colleges according to the success of the graduates at the examinations. It is interesting to compare the figures of these two last columns. While the Illinois group ranks first according to the number examined it ranks twentieth in the success of its graduates at the examinations. While Pennsylvania ranks third as to the number examined, it ranks sixteenth in the success of its graduates at the examinations, and while Tennessee ranks fourth as to the number examined, it ranks as the twenty-ninth in the success of its graduates at the examinations.

NONRECOGNITION OF MEDICAL COLLEGES

Table D shows for each college, from official reports, the states in which its diplomas are not given unqualified recognition. Nonrecognition is expressed by different terms in different states. Some boards list colleges as "in good standing" or "not in good standing," some give them as "reputable" or "not reputable"; in New York full recognition is given only to colleges which are "registered," and in Michigan colleges are divided into groups, only those of Group I having full recognition. There are twenty-one states which do not register graduates of a medical college unless such graduates had completed at least two years of collegiate work prior to entering on the study of medicine. This table also shows the latest rating given to each college by the Council on Medical Education.

TABLE 1.—RECOGNITION OF MEDICAL COLLEGES (BASED ON TABLE D)

	Number of Colleges
Recognized by all state boards	60
Not recognized by 1 to 3 state boards	9
Not recognized by 9 to 27 state boards	14
Not recognized by 30 to 40 state boards	10
Total	93

From the point of view of the prospective student who may be selecting a medical college, the facts in Table D are of extreme importance. There are 60 medical colleges now having complete recognition in all states. There are 9 others for which the one or two instances of nonrecognition are due to certain technicalities. If the student gets his medical training in one of the remaining 24 colleges, he will find on graduation that his diploma is not recognized in from 9 to 40 states!

Without the information published in Table D, these state board statistics would be not merely incomplete—*they would be actually misleading.* For example, 67 graduates of the National University of Arts and Sciences Medical Department, of St. Louis, were examined during 1916, 54 in Missouri and 13 elsewhere and only 8, or 11.9 per cent., failed. The low failure percentage makes this college appear to rank among the better teaching institutions in the country. How different the picture, however, when the facts set forth in Table D show that graduates of this college are admitted to the licensing examination in only ten states. In other words its diplomas are reported not recognized in 39 states!

During the four years this table has been published, the totals of fully recognized colleges were, respectively, 31, 33, 42 and 58. Thirty-nine state licensing boards, to some extent at least, are utilizing their legal power to refuse recognition to medical colleges which do not exact for admission certain educational qualifications, or which otherwise do not meet the requirements in the respective states. In the other ten states, however, and in the District of Columbia, this table indicates that either the practice acts do not give the boards authority to enforce a requirement of reasonable standards, or else the boards are not exercising that authority. It is evident that if the graduates of low-standard medical colleges are not eligible for license in the majority of states, they will flock to the other eleven which still grant them recognition. *These eleven states, therefore, are literally the dumping ground for the output of low-grade medical colleges, and will remain so until the licensing boards obtain the needed legal powers, or until the boards having the authority take action in the matter.*

SOURCE OF CANDIDATES REGISTERED BY EXAMINATION

Of the 4,123 physicians registered by examination in 1916, 3,106, or 75.3 per cent., graduated from Class A medical colleges; 654, or 15.9 per cent., were from Class B medical colleges; and only 156, or 3.8 per cent., were from Class C medical colleges. Five per cent. of all candidates came from medical colleges which have ceased to exist and from foreign medical colleges. A comparison of these figures with the

TABLE 2.—SOURCE OF CANDIDATES REGISTERED BY EXAMINATION

	1910		1916	
	Number	Per Cent.	Number	Per Cent.
Class A medical colleges	3,870	67.7	3,106	75.3
Class B medical colleges	977	17.1	654	15.9
Class C medical colleges	292	5.1	156	3.8
Miscellaneous medical colleges	311	5.5	164	4.0
Foreign medical colleges	70	1.2	43	1.0
Undergraduates	192	3.4	.....	....
Totals	5,712	100	4,123	100

results for 1910, as shown in Table 2, will be interesting. The differences would be greater if the classification in 1910 had been as strict as that in 1916. It is interesting to note that in 1910, 3.4 per cent. of all candidates were undergraduates. Of the 1916 graduates, not a single undergraduate was registered.

TABLE 3.—FAILURE PERCENTAGES ACCORDING TO SOURCE OF APPLICANTS

Medical Colleges	1910				1916			
	Examined	Passed	Failed	Per Cent. Failed	Examined	Passed	Failed	Per Cent Failed
Class A	4,318	3,870	448	10.4	3,396	3,106	290	8.5
Class B	1,268	977	291	22.9	861	654	207	24.0
Class C	479	292	187	39.0	221	156	65	29.4*
Miscellaneous	478	311	167	34.9	294	164	130	44.2
Foreign	108	70	38	35.2	78	43	35	44.9
Undergraduates	353	192	161	45.6	.....	.....	.....	.....

* Class C colleges at present, as a rule, are not recognized in from 33 to 39 states. This percentage, therefore, is the result of examinations by partisan boards and in states where the boards do not have, or are not using, the authority to refuse recognition.

Table 3 will also be interesting, in that the failure percentages of candidates coming from the various groups of colleges support the classifications. It will be noted that graduates of Class A medical schools had a much lower percentage of failures than those from colleges in Classes B and C. In this connection it should be stated that the percentage of failures for Class C medical colleges would doubtless be higher except for the fact that graduates of several of these colleges were examined largely, if not entirely, by partisan or sectarian boards, and not by single boards which examine graduates of all schools.

STUDY OF TOTALS AND PERCENTAGES

A study of totals and percentages as compared with previous years is of interest. The total examined in 1916—4,850—is the lowest number of candidates examined for license in any year since the compiling of these statistics began. (See Table 4.) The number examined was 463 less than in 1915, 720 less than in 1914, and 3,185 less than in 1906, when 8,035 candidates were examined. Statistics regarding physicians licensed in the various states by reciprocity and by other methods are given in Tables I, J and K. By all methods—examination, reciprocity, under exemption, etc.—5,461 physicians were licensed during 1916, or 411 less than in 1915, 336 less than in 1914, and 2,404 less than in 1906, when 7,865 physicians were licensed.

TABLE F.—COLLEGES HAVING FIFTY OR MORE EXAMINED

TABLE SHOWS TOTAL NUMBER EXAMINED, TOTAL NUMBER PASSED, TOTAL NUMBER FAILED, PERCENTAGE OF FAILURES AND NUMBER OF STATES IN WHICH EACH COLLEGE HAD REPRESENTATIVES

COLLEGE	Graduates of All Years					Graduates of 1912-1916					Graduates of 1911 and Previous					Graduates of 1916					Marginal Number, Table A
	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	No. Examined	No. Passed	No. Failed	Per Cent. Failed	No. of States	
Chicago College of Medicine and Surgery	225	190	35	15.5	27	220	188	32	14.5	27	5	2	3	60.0	5	160	141	19	11.9	16	18
Jefferson Medical College	174	161	13	7.5	27	167	156	11	6.6	27	7	5	2	28.6	5	45	45	0	0.0	17	71
Loyola University, School of Medicine	163	125	38	23.3	24	157	121	36	22.9	22	6	4	2	33.3	5	107	84	23	21.5	14	22
Atlanta Medical College	157	142	15	9.6	12	149	135	14	9.4	11	8	7	1	12.5	6	129	123	6	4.7	7	15
Meharry Medical College	148	81	67	45.3	20	139	78	61	43.9	18	9	3	6	66.7	7	87	61	26	29.9	13	79
Rush Medical College	145	137	8	5.5	24	123	121	2	1.6	18	22	16	6	27.3	13	86	84	2	2.3	13	24
University of Illinois, College of Medicine	143	139	4	2.8	21	130	128	2	1.5	18	13	11	2	15.4	6	111	110	1	0.9	9	25
University of Maryland, School of Medicine	125	104	21	16.8	17	123	102	21	17.1	17	2	2	0	0.0	2	83	67	16	19.3	12	34
Medical College of Virginia	124	113	11	8.9	11	122	111	11	9.0	10	2	2	0	0.0	2	91	86	5	5.5	6	57
Vanderbilt University, Medical Department	111	105	6	5.4	18	109	104	5	4.6	18	2	1	1	50.0	2	83	83	0	0.0	10	82
Johns Hopkins University, Medical Department	103	96	7	6.8	29	87	83	4	4.6	25	16	13	3	18.7	9	47	45	2	4.3	10	33
Medical School of Harvard University	99	92	7	7.1	26	92	88	4	4.3	25	7	4	3	42.9	5	47	45	2	4.3	15	37
Tulane University of Louisiana, School of Med.	97	92	5	5.2	17	86	82	4	4.7	12	11	10	1	9.1	10	78	76	2	2.6	10	31
Long Island College Hospital	95	91	4	4.2	5	93	89	4	4.3	5	2	2	0	0.0	2	76	74	2	2.6	2	56
Columbia University	95	82	13	13.7	17	83	71	12	14.5	12	12	11	1	8.3	8	36	34	2	5.6	5	53
N. Y. Homeo. Med. Coll. and Flower Hospital	94	62	32	34.0	11	92	60	32	34.8	9	2	2	0	0.0	2	34	23	11	32.4	4	57
Medico-Chirurgical College of Philadelphia	90	74	16	17.8	16	89	73	16	18.0	15	1	1	0	0.0	1	14	12	2	14.3	7	72
Tufts College Medical School	86	74	12	13.9	11	80	70	10	12.5	9	6	4	2	33.3	4	56	53	3	5.4	5	38
University of Tennessee, College of Medicine	83	67	16	19.3	10	81	66	15	18.5	8	2	1	1	50.0	2	63	53	10	15.9	7	80
University of Louisville, Medical Department	79	67	12	15.2	23	67	59	8	11.9	16	12	8	4	33.3	12	53	50	3	5.7	10	30
Albany Medical College	77	61	16	20.8	7	73	59	14	19.2	6	4	2	2	50.0	2	38	36	2	5.3	2	52
University of Michigan Medical School	76	72	4	5.3	17	65	63	2	3.1	10	11	9	2	18.2	11	62	61	1	1.6	8	40
University of Pennsylvania, School of Medicine	72	69	3	4.2	20	62	61	1	1.6	18	10	8	2	20.0	7	19	19	0	0.0	9	74
University and Bellevue Hosp. Med. Coll.	68	63	5	7.3	7	63	59	4	6.3	5	5	4	1	20.0	8	35	32	3	8.6	3	60
Northwestern University Medical School	67	62	5	7.5	15	57	54	3	5.3	13	10	8	2	20.0	7	43	41	2	4.7	7	23
National University of Arts and Sciences	67	59	8	11.9	7	67	59	8	11.9	7	.....	.....	.....	.....	.....	61	55	6	9.8	5	44
Ohio State University College of Medicine	67	66	1	1.5	5	67	66	1	1.5	5	.....	.....	.....	.....	.....	65	65	0	0.0	4	64
St. Louis University, School of Medicine	64	63	1	1.6	11	61	60	1	1.6	9	3	3	0	0.0	3	50	50	0	0.0	6	46
Western Reserve University, School of Medicine	60	60	0	0.0	6	58	58	0	0.0	5	1	1	0	0.0	1	53	53	0	0.0	2	67
Detroit College of Medicine and Surgery	57	53	4	7.0	5	52	50	2	3.8	3	5	3	2	40.0	3	50	48	2	4.0	1	39
John A. Creighton Medical College	53	50	3	5.7	12	51	49	2	3.9	11	2	1	1	50.0	2	41	41	0	0.0	4	48
Marquette University	53	52	1	1.9	8	53	52	1	1.9	8	.....	.....	.....	.....	.....	46	46	0	0.0	2	89
Fordham University, School of Medicine	52	38	14	26.9	4	52	38	14	26.9	4	.....	.....	.....	.....	.....	24	17	7	29.2	1	55
Totals	3268	2861	407	12.4	....	3070	2713	357	11.6	....	198	148	50	25.3	....	2073	1913	160	7.7		

This table is especially interesting, since it gives data relating to the 33 larger medical colleges arranged according to the number of graduates examined. This allows of comparison between colleges having classes of nearly equal size. For the fourth consecutive year the Chicago College of Medicine and Surgery has had the largest number, the position having been held by the College of Physicians and Surgeons of Chicago in 1906, 1907 and 1912. In 1908 Jefferson Medical College had the highest number examined. In 1909, 1910 and 1911 the University of Louisville Medical Department had the largest number examined. The first place from the standpoint of the number examined, however, does not always mean first place from the standpoint of scholarship. Note the percentages of failures. The highest failure percentages are for Meharry Medical College, 45.3; New York Homeopathic Medical College, 34; Fordham University School of Medicine, 26.9; Loyola University School of Medicine, 23.3, and Albany Medical College, 20.8.

Of the 11 colleges having 100 or more examined, 7 have failure percentages of less than 10, while four stand out prominently with large failure percentages—15.5, 16.8, 23.3 and 45.3, and high percentages hold even in respect to graduates of 1916.

Of the 22 colleges having between 50 and 100 graduates examined, thirteen had failure percentages of less than 10; six had failure percentages between 10 and 20, and three had failure percentages above 20.

The average percentage of failures for these larger colleges for graduates of 1911 and previous years was 25.3; for graduates of 1912 to 1916 inclusive (recent graduates), 11.6; for graduates of 1916, 7.7, and for graduates of all years, 12.4. Of the 4,430 graduates of the 89 colleges in the United States which had graduates examined by state boards in 1916, these larger (37.1 per cent. of all) schools furnished 3,268, or 74 per cent., of the graduates examined.

Other deductions from the larger tables presented in Tables E to H are worthy of special study.

STUDY OF COLLEGES BY STATE GROUPS

Table E gives the results for the group of colleges located in each state. It shows what states are furnishing the largest number of physicians, and the failure percentages indicate what kind of training these colleges are furnishing, so far as may be judged from the results of state board examinations. Of the thirty-three states having medical colleges which grant degrees, twelve furnished 100 or more candidates examined, six states furnished more than 200 each, and four furnished

TABLE G.—COMPARISON OF RESULTS IN HOME STATES AND ELSEWHERE. BASED ON TABLE B.

COLLEGES	Total Examined	Results in Home State			Results in Other States		
		Passed	Failed	Per Cent. Failed	Passed	Failed	Per Cent. Failed
ALABAMA +94.1	**18**	**16**	**1**	**5.9**	**0**	**1**	**100.0**
University of Alabama, School of Med.	18	16	1	5.9	0	1	100.0
ARKANSAS —	**17**	**16**	**1**	**5.9**			
University of Arkansas, Medical Dept.	17	16	1	5.9			
CALIFORNIA +9.2	**121**	**101**	**2**	**1.9**	**16**	**2**	**11.1**
College of Medical Evangelists	13	9	0	0.0	4	0	0.0
College of Phys. and Surgs., Los Angeles	26	23	0	0.0	3	0	0.0
Coll. of Phys. and Surgs., San Francisco	9	5	1	16.7	2	1	33.3
Hahnemann Med. Coll. of the Pacific	13	10	1	9.1	1	1	50.0
Leland Stanford Junior University	25	22	0	0.0	3	0	0.0
Oakland College of Med. and Surg.	2	2	0	0.0			
University of California Medical School	33	30	0	0.0	3	0	0.0
COLORADO —	**15**	**11**	**0**	**0.0**	**4**	**0**	**0.0**
University of Colorado	15	11	0	0.0	4	0	0.0
CONNECTICUT —16.7	**11**	**5**	**1**	**16.7**	**5**	**0**	**0.0**
Yale University	11	5	1	16.7	5	0	0.0
DISTRICT OF COLUMBIA +1.6	**68**	**19**	**3**	**13.6**	**39**	**7**	**15.2**
Georgetown University	20	4	0	0.0	15	1	6.3
George Washington University	24	14	1	6.7	8	1	11.1
Howard University	24	1	2	66.7	16	5	23.8
GEORGIA +26.1	**177**	**108**	**0**	**0.0**	**51**	**18**	**26.1**
Atlanta Medical College	140	97	0	0.0	38	14	26.9
Georgia Coll. of Eclectic Med. and Surg.	9	*			6	3	33.3
University of Georgia	19	11	0	0.0	7	1	12.5
ILLINOIS +0.2	**734**	**465**	**63**	**11.9**	**181**	**25**	**12.1**
Chicago College of Medicine and Surgery	220	138	20	12.7	50	12	19.4
Chicago Hospital College of Medicine	10	3	6	66.7	1	0	0.0
Hahnemann Medical College and Hospital	25	16	3	15.8	6	0	0.0
Jenner Medical College	12	7	4	36.3	1	0	0.0
Loyola University	157	89	26	22.6	32	10	23.8
Northwestern University	57	39	2	4.9	15	1	6.3
Rush Medical College	123	77	1	1.3	44	1	2.2
University of Illinois	130	96	1	1.0	32	1	3.0
INDIANA —5.7	**36**	**33**	**2**	**5.7**	**1**	**0**	**0.0**
Indiana University	36	33	2	5.7	1	0	0.0
IOWA —	**28**	**27**	**0**	**0.0**	**1**	**0**	**0.0**
State Univ. of Iowa, Coll. of Med.	28	27	0	0.0	1	0	0.0
State Univ. of Iowa, Coll. of Homeo. Med.							
KANSAS —	**11**	**11**	**0**	**0.0**			
University of Kansas	11	11	0	0.0			
KENTUCKY +17.2	**67**	**38**	**2**	**5.0**	**21**	**6**	**22.2**
University of Louisville	67	38	2	5.0	21	6	22.2
LOUISIANA +11.1	**86**	**50**	**0**	**0.0**	**32**	**4**	**11.1**
Tulane University of Louisiana	86	50	0	0.0	32	4	11.1
MAINE —9.1	**13**	**10**	**1**	**9.1**	**2**	**0**	**0.0**
Bowdoin Medical School	13	10	1	9.1	2	0	0.0
MARYLAND —9.2	**210**	**73**	**16**	**17.0**	**107**	**9**	**7.8**
Johns Hopkins University	87	37	2	5.1	46	2	4.2
University of Maryland	123	41	14	25.5	61	7	10.3
MASSACHUSETTS —1.2	**212**	**102**	**15**	**12.8**	**84**	**11**	**11.6**
Boston University	23	13	1	7.2	8	1	11.1
College of Phys. and Surgs., Boston	17	7	8	53.3	0	2	100.0
Medical School of Harvard University	92	32	0	0.0	56	4	6.7
Tufts College Medical School	80	50	6	10.7	20	4	16.7
MICHIGAN +11.5	**128**	**111**	**2**	**1.8**	**13**	**2**	**13.3**
Detroit College of Medicine and Surgery	52	48	2	4.0	2	0	0.0
University of Michigan, Medical School	65	55	0	0.0	8	2	20.0
University of Michigan, Homeo. Med. Sch.	11	8	0	0.0	3	0	0.0
MINNESOTA —	**38**	**33**	**0**	**0.0**	**5**	**0**	**0.0**
University of Minnesota	38	33	0	0.0	5	0	0.0
MISSOURI +4.2	**171**	**104**	**4**	**3.7**	**53**	**5**	**7.9**
Kansas City College of Med. and Surg.	12	*			12	0	0.0
National University of Arts and Sciences	67	54	4	6.9	5	4	44.4
Southwest School of Medicine and Hosp.	13	*			13	0	0.0
St. Louis University	61	36	0	0.0	24	1	4.0
Washington University	18	14	0	0.0	4	0	0.0
NEBRASKA +23.1	**57**	**44**	**0**	**0.0**	**10**	**3**	**23.1**
John A. Creighton Medical College	51	40	0	0.0	9	2	18.2
Lincoln Medical College	3	2	0	0.0	0	1	100.0
University of Nebraska	3	2	0	0.0	1	0	0.0
NEW HAMPSHIRE —	**1**				**1**	**0**	**0.0**
Dartmouth Medical School	1				1	0	0.0
NEW YORK —4.7	**565**	**408**	**83**	**16.9**	**65**	**9**	**12.2**
Albany Medical College	73	50	12	19.4	9	2	18.2
Columbia University	83	52	10	16.1	19	2	9.5
Cornell University Medical College	25	25	0	0.0			
Fordham University	52	33	14	29.8	5	0	0.0
Long Island College Hospital	93	85	3	3.4	4	1	20.0
N. Y. Homeo. Med. Coll. and Flower Hosp.	92	44	28	38.9	16	4	20.0
N. Y. Med. Coll. and Hosp. for Women	15	8	7	46.7			
Syracuse University	25	24	0	0.0	1	0	0.0
University and Bellevue Hosp. Med. Coll.	63	50	4	7.4	9	0	0.0
University of Buffalo	44	37	5	11.9	2	0	0.0
NORTH CAROLINA +62.5	**20**	**14**	**2**	**12.5**	**1**	**3**	**75.0**
North Carolina Medical College	20	14	2	12.5	1	3	75.0
OHIO +6.8	**185**	**158**	**2**	**1.2**	**23**	**2**	**8.0**
Eclectic Medical College	29	18	2	10.0	8	1	11.1
Ohio State University, College of Med.	67	61	0	0.0	5	1	16.7
Ohio State Univ., Coll. of Homeo. Med.	7	7	0	0.0			
University of Cincinnati, College of Med.	24	21	0	0.0	3	0	0.0
Western Reserve University	58	51	0	0.0	7	0	0.0
OKLAHOMA +25.6	**19**	**12**	**1**	**7.7**	**4**	**2**	**33.3**
University of Oklahoma	19	12	1	7.7	4	2	33.3
OREGON —16.7	**19**	**10**	**2**	**16.7**	**7**	**0**	**0.0**
University of Oregon	19	10	2	16.7	7	0	0.0
PENNSYLVANIA —2.0	**398**	**187**	**17**	**8.3**	**174**	**20**	**10.3**
Hahnemann Medical College and Hosp.	21	14	0	0.0	7	0	0.0
Jefferson Medical College	167	68	4	5.7	88	7	7.4
Medico-Chirurgical Coll. of Philadelphia	89	46	10	17.9	27	6	18.2
Temple University	23	16	3	15.8	2	2	50.0
University of Pennsylvania	62	25	0	0.0	36	1	2.7
University of Pittsburgh	14	11	0	0.0	3	0	0.0
Woman's Medical College of Pennsylvania	22	7	0	0.0	11	4	26.7
SOUTH CAROLINA —	**19**	**15**	**0**	**0.0**	**4**	**0**	**0.0**
Medical College of South Carolina	19	15	0	0.0	4	0	0.0
TENNESSEE +19.1	**371**	**113**	**19**	**14.4**	**159**	**80**	**33.5**
Lincoln Memorial University	15	10	0	0.0	4	1	20.0
Meharry Medical College	139	28	11	28.3	50	50	50.0
University of Tennessee	81	16	0	0.0	50	15	23.1
University of West Tennessee	27	5	8	61.5	5	9	64.3
Vanderbilt University	109	54	0	0.0	50	5	9.1
TEXAS —10.2	**71**	**53**	**6**	**10.2**	**12**	**0**	**0.0**
Baylor University	27	19	5	20.8	3	0	0.0
Fort Worth School of Medicine	7	4	1	20.0	2	0	0.0
University of Texas	37	30	0	0.0	7	0	0.0
VERMONT +14.3	**34**	**13**	**0**	**0.0**	**18**	**3**	**14.3**
University of Vermont	34	13	0	0.0	18	3	14.3
VIRGINIA +10.2	**142**	**81**	**3**	**3.6**	**50**	**8**	**13.8**
Medical College of Virginia	122	70	3	4.1	41	8	16.3
University of Virginia	20	11	0	0.0	9	0	0.0
WISCONSIN +12.5	**53**	**45**	**0**	**0.0**	**7**	**1**	**12.5**
Marquette University	53	45	0	0.0	7	1	12.5
Totals +7.0	**4115**	**2491**	**248**	**9.1**	**1155**	**221**	**16.1**

* These three colleges (in Georgia and Missouri) are reported as not recognized by the licensing boards in the home states.

In this table the graduates of each college who were examined in the state in which the college is located are grouped in one column, while graduates of that college examined in other states are in another column. For example, under Kentucky, this table shows that, of the 67 graduates of the University of Louisville Medical Department who were examined by state boards during 1916, 40 were examined in Kentucky, of which number 38 passed and 2, or 5.0 per cent., failed, while 27 were examined in other states, of which number 21 passed and 6, or 22.2 per cent., failed.

This table shows that in most instances the graduates have better chances of passing examinations in the state in which their colleges are located than they have elsewhere. This should always be considered in making comparisons between colleges. A low standard college by having all its graduates examined in the home state, or by a partisan board, may show a lower percentage of failures than a college of much higher grade which has graduates examined by several states.

The heavy-faced figures give the results by states. The first column of heavy-faced figures, preceded by the + and — signs, shows the differences between the percentages of examination in the home state and the examination elsewhere. The plus sign indicates that graduates have better chances of success in the state where the colleges from which they graduated are located; the minus sign indicates that the chances are better elsewhere. The most marked variations in 1916 were in the examination of the graduates of the colleges of Alabama, 94.1 per cent.; North Carolina, 62.5; Georgia, 26.1; Oklahoma, 25.6, and Nebraska, 23.1, in all of which the chances of the graduates were better in the home state. The marked variations where the graduates' chances were better elsewhere were in Connecticut and Oregon, each 16.7, and in Texas, 10.2 per cent.

The danger of forming hasty conclusions from these percentages taken alone, however, is very well shown by the figures for Alabama where 18 graduates of the University of Alabama School of Medicine were examined, and where the failure of the one examined in "other states" may have been accidental. More reliable are the percentages in Tennessee, Illinois, Pennsylvania, Kentucky and Missouri where larger numbers were examined both at home and in "other states." The totals show that, on the average, the chances of success were 6.0 per cent. better if the graduate took the examination in the state where his college was located.

over 300 each. Illinois furnished 794 graduates, the largest number, followed by New York with 595, Pennsylvania with 423 and Tennessee with 385. Of the thirty-three groups of colleges, nineteen had failure percentages of less than 10 per cent., nine had failure percentages between 10 and 20, and five had 20 per cent. or more of failures. Of all states, the highest failure percentage was obtained by the North Carolina group, 31.8, followed by the Tennessee group, with 28.1 per cent. Other deductions are given in the legend to the table.

Study of Larger Colleges

Table F is also based on the three large tables, and gives the results of state board examinations as they affect the thirty-three largest medical colleges. Although these colleges represent 37.1 per cent. of the medical colleges in the United States having graduates examined, they furnish 74.0 per cent. of all candidates for license coming from medical schools of the United States. This table shows, however, that the graduating of large classes by a medical college does not prove excellence of teaching, since four of the colleges having 100 or more examined have high failure percentages, and this holds true even for the graduates of 1916. In fact, the larger the college from the point of view of the number of students and graduates, the more serious is inferior teaching ability, as indicated by a high failure percentage. In fairness to medical students, and in the interests of the public, such schools should greatly strengthen their teaching facilities or reduce the size of their classes.

TABLE 4.—TOTAL RESULTS
Comparison with Previous Years

Year	Table A				B		C		A		I	Total Registered
	Total Examined	Examined—Passed	Examined—Failed	Percentage Failed	Recent Grads. Examined	Percentage Failed	Older Prac. Examined	Percentage Failed	Nongrads. Examined	Percentage Failed	Registered without Written Examination	
1904	7035	5672	1363	19.3	4773	14.1	579	29.7	515	52.6	999	6671
1905	7170	5680	1490	20.8	6054	16.2	690	37.7	472	61.9	394	6074
1906	8035	6368	1667	20.7	6250	16.4	793	27.1	703	51.3	1497	7865
1907	7271	5723	1548	21.3	5922	15.1	675	27.7	674	69.6	1426	7149
1908	7770	6084	1686	21.7	6477	17.8	796	31.5	494	56.8	1276	7360
1909	7287	5857	1430	19.6	5891	15.4	958	30.0	438	54.1	1373	7220
1910	7004	5712	1292	18.4	5678	14.9	973	29.1	353	45.6	1640	7352
1911	6960	5578	1382	19.9	5685	17.2	945	29.4	330	38.5	1246	6824
1912	6879	5466	1413	20.5	5770	18.6	856	29.2	253	34.8	1257	6723
1913	6435	5236	1199	18.6	5390	16.5	225	32.1	251	37.8	1265	6501
1914	5570	4370	1200	21.6	4549	17.6	728	30.0	293	61.4	1427	5797
1915	5313	4486	827	15.6	4627	13.2	621	29.3	65	49.2	1386	5872
1916	4850	4123	727	15.0	4283	12.7	567	32.1	.....	.....	1338	5461

Results in Home States and Elsewhere

Table G is of much interest, because it shows for each college the results of examinations in the state in which the college is located, as compared with the results of examinations in other states, where there is less probability of local influence. Of all recent graduates examined in 1916, coming from the eighty-nine medical colleges of the United States which had graduates examined, 2,739, or 61.8 per cent., took their license examinations in the states in which were located the colleges from which they graduated. Of this number, 9.1 per cent. failed on the average, whereas, of the 1,376 graduates examined in other states, 16.1 per cent. failed. This would indicate that, on the average, the student had 7 per cent. better chances of passing the license examination by taking it in the state in which the college is located. No graduates of the medical colleges in Georgia, Louisiana, Nebraska, Vermont and Wisconsin failed in the examinations given in those states, although of the graduates of those colleges who were examined in other states, respectively, 26.1, 11.1, 23.1, 14.3 and 12.5 per cent. failed. A glaring fact to the contrary, however, is that twenty-five graduates of two low grade medical colleges not recognized in Missouri were examined in adjoining states, and not one of them failed! The student's chances for success at home and elsewhere were equal, or nearly so, in the groups of colleges of the District of Columbia, Illinois, Massachusetts and Pennsylvania. The student's chances were unusually better in the home state in Alabama, Georgia, Kentucky, Louisiana, Michigan, Nebraska, North Carolina, Oklahoma, Tennessee, Vermont, Virginia and Wisconsin, while of the colleges in Connecticut, Oregon and Texas the graduate's chances were far better in "other states."

Total Results for Five Years

Table H shows the number registered and the number rejected in each state for each of the past five years. A

TABLE H.—PHYSICIANS EXAMINED BY STATE BOARDS, 1912 TO 1916, INCLUSIVE

STATE	1912		1913		1914		1915		1916		Totals			
	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Registered	Rejected	Examined	Registered	Rejected	Percentage Rejected
Alabama	84	72	90	57	115	60	79	45	55	36	693	423	270	39.0
Alaska	...	...	...	...	4	0	6	0	11	1	22	21	1	4.5
Arizona	32	10	26	9	26	16	10	7	33	9	178	127	51	28.7
Arkansas	124	27	91	28	97	16	75	7	67	11	543	454	89	16.4
California	256	60	163	36	113	45	137	39	146	8	1003	815	188	18.7
Colorado	41	1	53	5	31	1	19	5	25	8	180	169	20	10.6
Connecticut	70	18	77	51	46	8	46	17	41	20	394	280	114	28.9
Delaware	22	1	12	1	18	0	13	0	13	2	82	78	4	4.9
Dist. of Columbia	49	7	55	5	47	12	51	13	33	14	286	235	51	17.8
Florida	114	31	116	49	106	37	83	25	68	18	647	487	160	24.7
Georgia	178	17	171	24	179	21	176	17	133	7	923	837	86	9.3
Idaho	35	12	21	2	19	2	23	1	29	0	144	127	17	11.8
Illinois	505	134	567	98	484	110	439	64	517	91	3009	2512	497	16.5
Indiana	95	4	101	1	48	2	49	3	49	4	356	342	14	3.9
Iowa	131	7	107	4	77	1	85	4	82	2	500	482	18	3.6
Kansas	50	12	89	7	37	4	29	4	32	1	265	237	28	10.6
Kentucky	88	8	78	12	59	7	83	7	66	10	418	374	44	10.5
Louisiana	128	36	69	20	76	24	69	21	68	10	521	410	111	21.3
Maine	74	17	46	9	54	11	63	6	25	2	307	262	45	14.7
Maryland	160	46	108	40	105	27	111	29	96	30	752	580	172	22.9
Massachusetts	227	54	215	74	226	97	238	65	166	40	1402	1072	330	23.5
Michigan	159	3	99	3	138	2	120	6	135	5	670	651	19	2.8
Minnesota	55	5	71	4	47	3	59	6	56	1	307	288	19	6.2
Mississippi	56	48	61	19	51	17	84	15	48	29	428	300	128	29.9
Missouri	213	32	200	25	195	33	200	22	161	13	1094	969	125	11.4
Montana	50	9	57	16	58	25	48	16	38	14	331	251	80	24.2
Nebraska	88	10	87	2	66	6	70	6	52	0	387	363	24	6.2
Nevada	8	1	10	3	7	3	12	1	10	1	56	47	9	16.1
New Hampshire	36	7	17	3	36	6	6	1	10	0	122	105	17	13.9
New Jersey	59	14	69	7	41	13	71	8	72	10	364	312	52	14.3
New Mexico	6	2	6	1	8	2	5	0	5	1	36	30	6	16.7
New York	433	153	511	205	501	169	618	165	523	159	3437	2586	851	24.8
North Carolina	87	37	77	34	81	37	106	30	96	18	603	447	156	25.9
North Dakota	15	7	16	13	15	1	10	5	15	5	102	71	31	30.4
Ohio	199	12	189	3	146	18	149	3	182	5	906	865	41	4.7
Oklahoma	94	27	58	5	48	12	50	13	52	8	367	302	65	17.7
Oregon	96	65	112	36	76	42	56	30	38	17	508	378	190	33.4
Pennsylvania	356	170	345	59	101	22	208	24	233	33	1551	1243	308	19.9
Rhode Island	39	12	28	4	27	5	26	6	27	7	181	147	34	18.8
South Carolina	90	35	99	47	68	37	53	36	53	24	542	363	179	33.0
South Dakota	16	1	30	1	25	4	25	0	18	2	122	114	8	6.6
Tennessee	313	76	306	94	149	205	101	4	128	20	1396	997	399	28.6
Texas	151	13	168	11	152	11	136	11	90	13	756	697	59	7.8
Utah	20	2	24	3	13	3	21	1	15	0	102	93	9	8.8
Vermont	45	2	24	2	28	0	36	0	17	0	154	150	4	2.6
Virginia	105	30	87	19	98	10	100	8	99	8	564	489	75	13.3
Washington	69	27	63	22	92	5	75	14	48	4	419	347	72	17.2
West Virginia	66	20	58	17	51	4	70	7	58	2	353	303	50	14.2
Wisconsin	68	19	98	8	81	4	74	10	72	4	438	393	45	10.3
Wyoming	11	0	10	1	4	0	13	0	17	0	56	55	1	1.8
Totals	6879		6434		5570		5313		4850		29046			
Registered	5466		5235		4370		4486		4123		23680			
Rejected	1413		1199		1200		827		727		5366			
Per Cent. Rejected	20.5		18.6		21.6		15.6		15.0		18.5			

This table gives the number of candidates registered and rejected on examination by each state during each of the last five years. The last four columns give the totals for the five years and the percentage rejected by each state.

Four states registered over 1,000 candidates by examination in the five years, these being New York, Illinois, Pennsylvania and Massachusetts. Over 2,000 were registered in only two states, New York with 2,586, and Illinois with 2,512. Altogether 23,680 physicians were registered by examination in five years, an average of 4,736 each year.

The seven highest percentages of rejections for the five years were in Alabama, 39.0; Oregon, 33.4; South Carolina, 33.0; Mississippi, 29.9; Connecticut, 28.9; Arizona, 28.7, and Tennessee, 28.6 per cent. Until 1916 Massachusetts, Oregon and Tennessee included nongraduates among those examined during the last five years, and for that reason would be expected to have higher percentages rejected. On the other hand, in several states the boards refused to recognize certain colleges and eliminated many candidates prior to the examination by a careful scrutiny of credentials and as a result the percentages of failures at the examinations are lower than otherwise would be the case. For example, Ohio rejected only 4.7 per cent. of those who took their examinations, but graduates of twenty medical colleges are not eligible for admission to the examinations.

Omitting Alaska, the lowest failure percentages were in Wyoming, 1.8; Vermont, 2.6; Michigan, 2.8; Iowa, 3.6; Indiana, 3.9, and Ohio, 4.7.

comparison of this table with the statistics in the last educational number of THE JOURNAL (Aug. 19, 1916, p. 598, Table 14) shows—what would be expected—that the states having the largest number of medical graduates examined the largest number of physicians. New York leads, having examined 3,437 candidates in five years, followed by Illinois with 3,009. The five states having the next highest numbers examined are Pennsylvania with 1,551, Massachusetts with 1,402, Tennessee with 1,396, Missouri with 1,094, and California with 1,003.

TOTAL REGISTRATION IN 1916

The tables thus far described have referred only to the results of examinations and to those registered on that basis.

TABLE I.—REGISTRATION BY STATE BOARDS DURING THE YEAR 1916

STATES	By Examination			By Reciprocity	Without Written Examination or Under Exemption	Total Registered
	Graduates, 1912-1916	Graduates, 1911 and Previous	Nongraduates			
Alabama	53	2	....	....	....	55
Alaska	1	10	....	....	....	11
Arizona	16	17	....	....	....	33
Arkansas	58	9	....	28	....	95
California	136	10	....	156	....	302
Colorado	22	3	....	61	....	86
Connecticut	33	8	....	6	11	58
Delaware	13	....	....	6	....	19
District of Columbia	25	8	....	11	....	44
Florida	47	21	....	....	....	68
Georgia	130	3	....	19	....	152
Idaho	10	19	....	4	....	33
Illinois	468	19	....	39	....	556
Indiana	46	3	....	27	1	77
Iowa	65	17	....	21	....	103
Kansas	32	....	....	63	....	95
Kentucky	61	5	....	6	3	75
Louisiana	64	4	....	9	....	77
Maine	19	6	....	6	....	31
Maryland	94	2	....	24	....	120
Massachusetts	150	16	....	....	....	166
Michigan	133	2	....	89	....	224
Minnesota	51	5	....	45	....	101
Mississippi	43	5	....	10	....	58
Missouri	145	16	....	51	....	212
Montana	15	23	....	....	1	39
Nebraska	51	1	....	18	....	70
Nevada	3	7	....	19	....	29
New Hampshire	9	1	....	15	....	25
New Jersey	69	3	....	91	....	163
New Mexico	2	3	....	9	49	63
New York	499	24	....	21	1	545
North Carolina	96	1	....	17	....	113
North Dakota	12	3	....	20	....	35
Ohio	178	4	....	69	....	251
Oklahoma	45	7	....	55	....	107
Oregon	21	17	....	....	....	38
Pennsylvania	221	12	....	19	....	252
Rhode Island	21	6	....	....	....	27
South Carolina	50	3	....	....	....	53
South Dakota	11	7	....	....	....	18
Tennessee	122	6	....	14	....	142
Texas	82	8	....	75	1	166
Utah	14	1	....	8	....	23
Vermont	16	1	....	6	....	23
Virginia	94	5	....	32	....	131
Washington	32	16	....	....	....	48
West Virginia	55	3	....	32	....	90
Wisconsin	68	4	....	55	....	127
Wyoming	8	9	....	15	....	32
Totals	3738	385	....	1271	67	5461

This table shows the total number registered during 1916 in each state by the various methods. The first three columns show those registered by examination: the first column showing the recent graduates registered, the second column the old practitioners (graduates of 1911 and previous years), and the third column the nongraduates, of which none were licensed in 1916. The fourth column shows the number licensed through reciprocity, the fifth column shows those licensed under various exemption clauses in the practice acts, such as because of national fame or by recognition of diplomas (New Mexico).

It is interesting to note that as a rule states which registered large numbers through reciprocity, Michigan, Colorado and New Jersey for example, examined very few old practitioners. The large registration through reciprocity in California is due to the liberal provision in the recent medical practice act providing for the recognition of licenses granted in other states. There were no reciprocal registrations in eleven states, including Alaska.

The last column shows the total number of physicians registered by all methods in each state during the year. Only three states registered over 300 each, these being Illinois, 556; New York, 545, and California, 302. Seventeen states registered less than 50 each. The largest registration was 556 in Illinois and the smallest was 11 in Alaska. The total was 5,461, a decrease of 411 below the total registered in 1915.

Table I, however, shows the total number who received licenses in each state, including those registered by examination, by reciprocity and under various exemption clauses. Altogether 5,461 physicians were registered by all methods during 1916, as compared with 5,876 in 1915, 5,797 in 1914, 6,501 in 1913, 6,723 in 1912, 6,824 in 1911 and 7,865 in 1906. There has been a constant decrease in the totals licensed by all methods until 1915, when there was an increase of 79. In 1916 the total registered was 411 less than in 1915. By reciprocity or under exemption clauses, 1,338 were licensed in 1916, as compared with 1,386 in 1915, 1,427 in 1914 and 1,265 in 1913. For the first years since the collection of these statistics was begun, no undergraduates were registered.

Over 100 were registered by all methods in nineteen states, over 200 in seven, and over 300 in three, the largest numbers registered being 556 in Illinois, 545 in New York and 302 in California. Of those licensed in California, 156, or 51.6 per cent., were registered by the endorsement of licenses granted by the boards of other states.

Table J gives those registered without examination on presentation of satisfactory credentials, which included a license issued by some other state. This is commonly referred to as "reciprocity," which conveys the idea that the state which accepts the license of another must be granted the same courtesy by the state issuing the original license. The term does not always apply, however, since some state boards—California, Colorado, New Hampshire and New Jersey, as examples—accept the physician's credentials, if satisfactory, whether or not the state board issuing the original license returns the favor. Had not reciprocal relations been established by the thirty-nine states shown in Table J, 1,271 physicians, many of whom have been in practice for ten or more years, would have been compelled to undergo the ordeal of a second trying examination.

Table K shows in what states were granted the original licenses of those who were registered elsewhere under the reciprocity provision during the last five years. It should be noted that of the 6,304 physicians licensed through reciprocity during the last five years, the largest number coming from any one state was 937, who obtained their original licenses in Illinois. Although Illinois and New York have about an equal number of medical college graduates each year,[1] only 374 physicians obtained original licenses in New York and registered elsewhere through reciprocity in the last five years. This is doubtless because Illinois has reciprocal relations with twenty other states, while New York has established such relations with only seven.

RECIPROCITY AND EDUCATIONAL STANDARDS

As usually administered, reciprocal relations tend to lower rather than to elevate educational standards, and this is particularly true in some states. A study of these statistics will show that, in several instances, such relations exist between states differing widely in their standards of education and in the methods and severity of their examinations. In a few states there is an inclination to accept graduates from medical colleges at home and abroad without first securing definite information regarding the character of those colleges. There are some boards, however, which wisely reserve and exercise the right to reject any candidate who does not possess satisfactory credentials, even though he is licensed in a state with which it has reciprocal relations. Some boards also prudently require that the applicant, before he is eligible to registration through reciprocity, must have been engaged in the actual and reputable practice of his profession for at least a year in the state in which the original license was granted. Without this provision a candidate would be tempted to obtain his original license in the state giving the easiest examination. Without the one-year clause, therefore, standards of examination are liable to be lowered, especially by such boards as retain the fees obtained from those examined.

Again, some states refuse to register by reciprocity any candidates who have failed to pass their own examination; but this rule is not generally observed. In the establishing of reciprocal relations, therefore, the state board should

1. See Table 14, THE JOURNAL A. M. A., Aug. 19, 1916, p. 598.

TABLE J.—PHYSICIANS REGISTERED THROUGH RECIPROCITY BY STATE EXAMINING BOARDS DURING 1916

STATE BOARDS OF	Total Reg. by Recip., Fa. State	Alabama	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	Dist. Columbia	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Louisiana	Maine	Maryland	Massachusetts	Michigan	Minnesota	Mississippi	Missouri	Montana	Nebraska	Nevada	New Hampshire	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia	Washington	West Virginia	Wisconsin	Wyoming	U. S. Navy	Alaska, Hawaii, etc.	Foreign
Arkansas	28	..	..	..	..	..	..	..	..	..	2	..	1	..	..	..	..	4	..	..	..	1	..	7	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	1	..	2	..	..	..	..	..	..	..
California	156	..	5	1	..	4	1	..	..	1	2	2	28	5	6	3	2	..	..	4	4	6	2	..	12	1	3	3	1	2	..	9	1	..	12	..	1	11	1	..	2	..	2	2	..	..	12	1	2	1	..	1	..
Colorado	61	1	..	..	1	..	..	1	..	..	1	..	10	1	5	2	..	2	..	..	1	1	2	1	8	..	2	..	..	..	..	4	1	..	1	1	1	7	..	..	1	3	..	1	1	..	..	1	..	..	..	..
Connecticut	6	..	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Delaware	6	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. of Columbia	11	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	2	..	2	..	..	..	..	..	..
Georgia	19	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	3	..	..	..	..	2	..	..	..	..	..	..	..	5	..	..	..	..	1	..	..	..	..	5	..	..	1	..	..	..	..	..	..
Idaho	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..	..
Illinois	39	..	..	1	..	..	..	..	..	..	..	..	..	4	..	1	6	1	..	1	..	4	..	..	10	..	2	..	..	..	..	..	..	2	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	1	..	..
Indiana	27	..	..	..	..	..	..	..	..	..	..	..	14	..	..	..	3	..	..	..	..	1	..	..	..	..	1	..	..	..	..	1	..	..	4	..	..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..
Iowa	21	..	..	..	..	..	..	..	..	..	1	..	..	..	..	3	1	..	..	..	..	..	3	..	7	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..
Kansas	63	..	..	15	..	..	..	..	..	..	1	..	5	..	1	..	6	..	..	..	..	..	..	..	21	..	2	..	..	1	..	..	..	..	1	4	..	1	..	1	..	..	2	..	..	..	1	..	1	..	..	..	..
Kentucky	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2	..	..	..	..	..	..	..	1	..	..	..	..
Louisiana	9	..	..	2	1	..	..	..	..	..	3	..	1	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Maine	6	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	..	..
Maryland	24	..	..	..	..	..	1	4	..	1	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	2	..	3	..	..	1	1	..	3	1	..	..	..
Michigan	89	1	..	2	..	1	..	1	..	..	..	1	27	1	2	..	2	1	1	5	..	..	..	..	6	..	2	2	1	..	..	2	..	..	7	1	..	8	..	..	..	3	..	..	1	2	..	3	6	..	..	..
Minnesota	45	..	..	..	..	..	..	1	..	..	..	..	19	1	7	..	..	..	..	1	..	1	..	..	..	..	2	..	..	..	2	..	..	..	1	..	..	..	..	1	..	..	..	1	..	..	..	1	..	8	..	..	..
Mississippi	10	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	3	2	..	..	..	..	..	..	..	..	1	..	..	..	..
Missouri	51	..	..	..	..	1	..	..	..	..	1	..	13	3	3	11	1	..	..	1	..	2	..	..	..	..	3	..	..	..	..	..	..	..	2	1	..	1	..	..	..	7	..	..	..	..	1	..	..	..	..	..
Nebraska	18	..	..	..	..	..	..	..	..	..	..	..	5	..	6	1	..	..	..	..	..	..	..	1	2	..	..	1	..	..	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..
Nevada	10	..	..	..	..	..	..	..	..	..	..	..	4	2	..	..	..	..	..	..	..	..	..	..	1	4	..	..	..	..	..	..	..	..	..	1	..	3	..	..	..	..	3	..	..	..	1	..	..	..	..	..	..
New Hampshire	15	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	12	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..
New Jersey	91	1	..	..	..	..	..	1	3	..	..	..	..	..	..	..	1	..	6	1	3	..	..	..	..	..	..	..	..	3	..	..	52	1	..	..	..	11	..	..	..	1	1	..	3	3	..	..	..	..	..	..
New Mexico	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..
New York	21	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	8	..	..	..	..	..	..	..	..	..	5	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..
North Carolina	17	..	..	..	..	..	..	1	..	3	..	..	1	..	..	1	1	..	1	..	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..
North Dakota	20	..	..	..	..	..	..	..	..	1	..	..	7	3	..	..	..	1	..	..	7	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ohio	69	..	..	..	..	..	..	1	..	..	..	..	9	3	1	..	1	..	3	9	..	11	1	..	4	..	..	..	..	..	..	1	..	9	..	..	..	8	..	..	..	..	2	..	1	..	..	4	1	..	..	..
Oklahoma	55	..	..	14	..	..	..	..	..	..	2	..	..	..	..	2	5	..	..	..	..	1	..	4	3	..	2	..	..	1	2	..	..	..	..	..	..	7	6	..	1	1	..	1	3	..	..	..	..	..	..
Pennsylvania	19	..	..	..	..	..	2	2	..	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..	2	..	..	..	1	1	..	..	..	5	..	..	..	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..
Tennessee	14	..	..	5	..	..	..	..	..	1	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	1	..	..	1	..	1	..	..	..	1	..	2	..	..	..	..	..	..	..	..	..
Texas	75	..	..	14	..	1	..	..	1	..	4	..	..	1	..	3	2	1	..	2	..	1	..	..	4	6	..	1	..	..	..	..	..	..	2	9	..	2	..	..	..	13	..	..	2	..	..	1	..	..	..	5
Utah	8	..	..	..	1	..	..	..	2	..	..	1	1	..	..	..	..	1	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vermont	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Virginia	32	1	..	..	..	..	..	..	3	..	2	..	1	..	..	..	2	1	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	8	..	..	..	3	..	1	..	1	..	..	..	..	..	5	..	..	..	1
West Virginia	32	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	5	..	..	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3	..	..	4	..	1	..	3	..	..	10	..	..	..	..	..	..	..
Wisconsin	55	..	..	2	..	..	..	..	..	1	1	25	1	..	2	2	1	..	..	1	..	2	4	..	4	..	1	..	..	..	..	2	..	1	2	..	..	..	..	..	3	..	..	..	..	..	..	..	..	..	..
Wyoming	15	..	..	..	..	..	..	..	..	..	..	..	7	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	4	..	..	..	1	..	..	..
Totals	1271	4	5	56	2	8	1	8	20	2	30	5	178	27	32	33	40	16	13	45	22	34	19	18	93	1	28	7	11	7	2	84	17	4	51	26	2	74	1	7	3	65	15	16	15	36	12	25	32	1	1	1	6
Number	....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52

This table shows the number of physicians registered by each state through reciprocity during 1916. Reading from left to right, it shows the total number of physicians registered through reciprocity in the state named and the numbers of such candidates coming from the states named at the top of the various columns. Reading from above downward, the figures show the number of physicians who left the state named at the head of the column and went to each of the states named in the corresponding lines, and at the bottom, the total number of candidates leaving the state to go elsewhere. For example, reading from left to right, the table shows that Mississippi registered ten candidates through reciprocity in 1916 and that, of these candidates, 3 came from Tennessee, 2 each from Missouri and Texas, and 1 each from Georgia, Kansas and Wisconsin. Reading from above downward, the table shows that from Mississippi 7 candidates went to Arkansas, 4 each to Oklahoma and Texas, and 1 each to Colorado, Nebraska and West Virginia, the total leaving the state to go elsewhere being 18. The line at the bottom shows in what states physicians who were registered through reciprocity obtained their original licenses. From Illinois 178 candidates obtained their original licenses, followed by Missouri with 93, New York with 84, Pennsylvania with 74, and Tennessee with 65.

TABLE K.—RECIPROCAL REGISTRATION IN FIVE YEARS (SHOWING WHAT STATES ISSUED ORIGINAL LICENSES)

STATE	Physicians Going from States Named During					Totals
	1912	1913	1914	1915	1916	
Alabama	1	2	1	1	4	9
Arizona	....	3	13	6	5	27
Arkansas	15	37	20	37	56	165
California	....	....	2	3	2	7
Colorado	9	12	25	15	8	69
Connecticut	1	2	1	3	1	8
Delaware	15	8	2	6	8	39
District of Columbia	18	17	22	18	20	95
Florida	1	1	2	4	2	10
Georgia	13	26	17	22	30	108
Idaho	5	....	5	1	5	16
Illinois	193	171	197	198	178	937
Indiana	40	33	44	43	27	187
Iowa	58	36	52	46	32	224
Kansas	27	32	42	39	33	173
Kentucky	36	43	35	48	40	202
Louisiana	10	13	10	16	16	65
Maine	23	9	11	12	13	68
Maryland	48	42	44	38	45	217
Massachusetts	2	2	7	19	22	52
Michigan	50	66	58	42	34	250
Minnesota	29	29	23	34	19	134
Mississippi	5	15	10	10	18	58
Missouri	67	61	98	104	93	423
Montana	1	....	3	1	1	6
Nebraska	29	34	37	50	28	178
Nevada	3	4	8	9	7	31
New Hampshire	1	7	3	4	11	26
New Jersey	18	10	19	22	17	86
New Mexico	4	8	9	5	2	28
New York	46	70	101	73	84	374
North Carolina	12	14	7	13	17	63
North Dakota	12	6	5	6	4	33
Ohio	39	50	71	47	51	258
Oklahoma	28	74	22	28	26	178
Oregon	....	3	3	2	2	10
Pennsylvania	57	86	86	79	74	382
Rhode Island	....	....	1	2	1	4
South Carolina	5	3	2	12	7	29
South Dakota	1	10	4	7	3	25
Tennessee	51	39	42	34	65	231
Texas	24	19	23	12	15	93
Utah	3	12	8	6	16	45
Vermont	30	11	21	25	15	102
Virginia	25	26	40	30	36	157
Washington	3	2	15	10	12	42
West Virginia	29	41	33	36	25	164
Wisconsin	35	28	41	29	32	165
Wyoming	4	4	3	5	1	17
Alaska, Hawaii, etc.	1	1	2	....	1	5
U. S. Army	2	1	2	1	....	6
U. S. Navy	....	....	....	....	1	1
U. S. P. H. Service	....	....	....	....	....	....
Canada	....	....	1	....	1	2
Foreign and Misc.	3	....	2	1	5	11
Totals	1141	1223	1355	1314	1271	6304

This table shows that 6,304 candidates were registered through reciprocity during the last five years. Registration by reciprocity gradually increased from 1905 to 1914, since which time there has been a gradual decrease as the total of physicians licensed by other methods has decreased. A study of the totals for the different states shows that of the 6,304 registered during the five years 937, or 14.9 per cent., obtained their original licenses in Illinois. This is more than twice the number coming from any other state. The states furnishing the next highest numbers are Missouri, 423; Pennsylvania, 382, and New York, 374. New York might lead Illinois but reciprocal relations have been established with only seven other states.

Nine states (Alabama, Arizona, Connecticut, Florida, Massachusetts, Montana, Oregon, Rhode Island, and Washington) do not have reciprocal relations and would not appear in this table except for the fact that some states, like California, Colorado, New Hampshire and New Jersey, will accept a physician's credentials if satisfactory, whether the state issuing the original license returns the favor or not.

TABLE L.—STATE REQUIREMENTS OF HIGHER PRELIMINARY EDUCATION

There are now thirty-six states which have adopted requirements of preliminary education in addition to a standard four-year high school education. These states, the number of college years required and the time the higher requirement becomes effective are as follows:

State Examining Board of	Number of Years Required	Affects Students Matriculating	Affects All Graduates
Requiring Two Years:			
Alabama	2	1915-16	1919
Arizona	2	1918-19	1922
Colorado	2	1910-11	1914
Indiana	2	1911-12	1915
Iowa	2	1911-12	1915
Kansas	2	1918-19	1922
Louisiana	2	1918-19	1922
Maryland	2	1918-19	1922
Minnesota	2	1908-09	1912
Montana	2	1918-19	1922
New Hampshire	2	1915-16	1919
New Jersey	2	1917-18	1921
New Mexico	2	1918-19	1922
North Dakota	2	1908-09	1912
Oklahoma	2	1917-18	1921
Rhode Island	2	1918-19	1922
South Carolina	2	1918-19	1922
South Dakota	2	1911-12	1915
Virginia	2	1917-18	1921
Washington	2	1918-19	1922
Wisconsin	2	1915-16	1919
Requiring One Year:			
Arkansas	1	1915-16	1919
California	1	1915-16	1919
Connecticut	1	1910-11	1914
Illinois	1	1915-16	1919
Indiana*	1	1910-11	1914
Kansas*	1	1910-11	1914
Kentucky	1	1914-15	1918
Louisiana*	1	1915-16	1919
Maryland*	1	1914-15	1918
Michigan	1	1914-15	1918
Mississippi	1	1915-16	1919
New Hampshire*	1	1914-15	1918
New Jersey*	1	1916-17	1920
New York	1	1917-18	1921
North Carolina	1	1914-15	1918
Oklahoma*	1	1914-15	1918
Pennsylvania	1	1914-15	1918
Rhode Island*	1	1914-15	1918
Tennessee	1	1915-16	1919
Texas	1	1914-15	1918
Utah	1	1913-14	1917
Vermont	1	1913-14	1917
Virginia*	1	1914-15	1918
Washington*	1	1914-15	1918
West Virginia	1	1917-18	1921

* The 2-year requirement became or becomes effective at a later date.

TABLE M.—ADVANCES IN STATE LICENSE REQUIREMENTS IN TEN YEARS

Requirement or provision	States having provision for			States still having no provision for
	1904	1917	Increase	
Preliminary Education—				
Any requirement	20	46	26	3[1]
A standard four-year high school education or higher	10	44	34	5[2]
One year or more of college work	0	36	36	13
Two years of college work as a minimum	0	21	21	28
That all applicants be graduates of a medical college	36	49	13	0
That all applicants undergo an examination for license	45	48	3	1[3]
Requirement of practical tests in the license examinations	1	16	15	33
Hospital intern year required	0	6	6	43
Full authority by board to refuse recognition to low-grade colleges	14	42	28	7[4]
Boards refusing to recognize low-grade colleges*	5	39	34	10[5]
Reciprocal relations with other states	27	40	13	9[6]
Single boards of medical examiners	36	42	6	7[7]

* In three states, Arkansas, Connecticut and Florida, each of which has three separate boards, only the regular (nonsectarian) boards have refused recognition to low standard medical colleges.

1. District of Columbia, Massachusetts and Wyoming.
2. Idaho, Oregon and the states named in Footnote 1.
3. New Mexico.
4. District of Columbia, Idaho, Massachusetts, Nebraska, Oregon, Utah and Wyoming.
5. California, Nevada, Tennessee and the states named in Footnote 4.
6. Alabama, Arizona, Connecticut, Florida, Massachusetts, Montana, Oregon, Rhode Island and Washington. To this list should be added the outlying territories of Alaska, Canal Zone, Philippine Islands and Porto Rico, which have no provision for reciprocity.
7. Multiple boards still remain in Arkansas, Connecticut, Delaware, District of Columbia, Florida, Louisiana and Maryland.

reserve and exercise the discretionary power *to refuse to register any candidate who could not originally have registered in that state,* and should require that the applicant shall have been in actual practice of medicine for at least a year before he is eligible to registration under the reciprocity provision.

IMPROVED STANDARDS OF LICENSURE

Table L shows the states which have adopted one or two years of college work as a minimum standard of preliminary education for those who seek the license to practice medicine in those states. The first column shows the number of years of premedical college work required by each state; the second column shows the session in which students matriculating in medical colleges are affected by the increased requirement, and the third column gives the year in and after which all graduates are affected by the increased requirement. This table shows the remarkable progress which has been made.

TABLE N.—ESSENTIAL FEATURES OF STATE LAWS AND CONDITIONS SURROUNDING MEDICAL LICENSURE

STATE	Graduation Required	Preliminary Education: Law Provides For	Preliminary Education: Years in High School Required	Preliminary Education: Years in a College of Arts[2]	Medical Education: Required Years of Medical Study	Medical Education: Minimum Hours per Week	Medical Education: Minimum Weeks per Year	Medical Education: Intern Year Required	Reciprocity: Has Reciprocity with Other States	Reciprocity: One or More Years of Practice Required	Reciprocity: Reciprocal Fee	Single Examining Board	Examination Fee
Alabama	....	Yes	4	2	4	....	....	....	No	.....	....	....	$10
Alaska	....	Yes	4	....	4	....	....	....	Yes	.....	$25	....	25
Arizona	....	Yes	4	1[6]	4	....	....	....	No	.....	....	....	25
Arkansas	....	Yes	4	1	4	....	....	....	Yes	4	50	No	15
California	....	Yes	4	1	4	....	32	....	Yes	Yes	50	....	25
Canal Zone	....	....	....	....	....	....	....	....	No	.....	....	....	5
Colorado	No	Yes	4	2	4	....	....	....	Yes	.....	25	....	25
Connecticut	....	Yes	4	1	4	36	26	....	No	.....	15	No	15
Delaware	....	Yes	4	....	4	....	....	....	Yes	Yes	50	No	10
Dist. of Col.	....	....	....	....	4	....	....	....	Yes	Yes	10	No	10
Florida	....	Yes	4	....	4	....	....	....	No	.....	....	No	15
Georgia	....	Yes	4	....	4	40	32	....	Yes	No	50	....	20
Hawaii	....	....	....	....	4	....	....	....	No	.....	....	....	10
Idaho	....	Yes	....	....	....	....	....	....	Yes	Yes	25[3]	....	25
Illinois	....	Yes	4	1	4	....	32	Yes	Yes	Yes	10[3]	....	10
Indiana	....	Yes	4	2	4	30	30	....	Yes	Yes	50	....	25
Iowa	....	Yes	4	2	4	....	26	....	Yes	Yes	50	....	10
Kansas	....	Yes	4	2	4	....	....	....	Yes	.....	15[3]	....	15
Kentucky	....	Yes	4	1	4	....	32	....	Yes	Yes	10	....	10
Louisiana	....	Yes	4	2	4	....	....	....	Yes	Yes	50	No	25
Maine	....	Yes	4	....	4	....	....	....	Yes	No	15	....	15
Maryland	....	Yes	4	2	4	....	....	....	Yes	Yes	25	No	15
Massachusetts	....	....	....	....	....	....	....	....	No	.....	....	....	20
Michigan	....	Yes	4	1	4	36	34½	Yes	Yes	No	50	....	25
Minnesota	....	Yes	4	2	4	....	26	....	Yes	No	50	....	10
Mississippi	....	Yes	4	1	4	....	....	....	Yes	Yes	50	....	10
Missouri	....	Yes	4	....	4	....	....	....	Yes	Yes	25	....	15
Montana	....	Yes	4	2	4	....	....	....	No	.....	....	....	25
Nebraska	....	Yes	4	....	4	....	....	....	Yes	Yes	25	....	25
Nevada	....	Yes	4	....	4	....	....	....	Yes	Yes	25	....	25
New Hampshire	....	Yes	4	2	4	....	....	....	Yes	Yes	20	....	20
New Jersey	....	Yes	4	2	4	....	....	Yes	Yes	No	50	....	25
New Mexico	1	Yes	4	2	4	30	30	....	Yes	Yes	25	....	25
New York	....	Yes	4	1	4	....	....	....	Yes	Yes	25	....	25
North Carolina	....	Yes	4	1	4	....	....	....	Yes	Yes	50	....	15
North Dakota	....	Yes	4	2	4	30	30	Yes	Yes	Yes	25	....	25
Ohio	....	Yes	4	....	4	....	30	....	Yes	Yes	50	....	25
Oklahoma	....	Yes	4	2	4	....	....	....	Yes	Yes	25	....	15
Oregon	....	Yes	4	....	4	....	....	....	No	.....	....	....	10
Pennsylvania	....	Yes	4	1	4	35	32	Yes	Yes	Yes	50	....	25
Philippine Is.	....	Yes	....	....	....	....	....	....	No	.....	....	....	25
Porto Rico	....	....	....	....	....	....	....	....	No	.....	....	....	20
Rhode Island	....	Yes	4	2	4	....	....	Yes	No	.....	....	....	20
South Carolina	....	Yes	4	2	4	....	26	....	Yes	Yes	10	....	10
South Dakota	....	Yes	4	2	4	....	26	....	Yes	Yes	50	....	20
Tennessee	....	Yes	4	1	4	....	....	....	Yes	Yes	10	....	10
Texas	....	Yes	4	1	4	....	....	....	Yes	Yes	50	....	25
Utah	....	Yes	4	1	4	....	....	....	Yes	Yes	75	....	25
Vermont	....	Yes	4	1	4	....	....	....	Yes	No	50	....	20
Virginia	....	Yes	4	2	4	....	....	....	Yes	Yes[5]	50	....	25
Washington	....	Yes	4	2	4	....	32	....	No	.....	....	....	25
West Virginia	....	Yes	4	1	....	....	....	....	Yes	Yes	25	....	10
Wisconsin	....	Yes	4	2	4	....	....	....	Yes	Yes	50	....	25
Wyoming	....	....	....	....	....	....	....	....	Yes	No	25	....	25

1. Will accept a diploma without examination if from a recognized college.
2. Reciprocal fee same as charged by the state from which applicant comes.
3. Or its equivalent in the medical college.
4. In some instances.
5. Or two years hospital experience.

in state board requirements since 1908, prior to which no state was requiring more than a four-year high school education as the minimum standard of preliminary education. As will be noted, there are now thirty-six states which have adopted the higher standard, twenty-one of which require as a minimum *two years* of premedical college work. It is understood that in every instance the one or two years of collegiate work must have included courses in physics, chemistry and biology.

In Table M the advance in standards of licensure is shown for all states since 1904. The most marked increase is in regard to the requirement of collegiate work in thirty-six states as referred to in Table L. The next greatest increase (thirty-four) is in the number of states—now thirty-nine—which are refusing to recognize low-grade medical colleges. Although, as shown in the third column, marked improvements have been made in state requirements for licensure, nevertheless, as indicated by the last column, there is abundant room for further improvement. The greatest needs are for a wider adoption of the standard of two years of premedical college work, the requirement of the hospital intern year, and a more general and larger use of practical tests in the examinations.

Table N shows the essential features of the various state license laws. It will be noted that only one state—Colorado—now admits nongraduates to the license examination, although only four nongraduates have been licensed in that state in ten years. There are seven states in which there are two or three separate boards having in charge the licensing of physicians and surgeons. In five of these states, namely, Arkansas, Connecticut, Florida, Louisiana and Maryland, the boards are entirely independent of each other with varying degrees of inefficiency naturally resulting from such a division of authority. In two states, Delaware and the District of Columbia, there is a central board or authority under which the separate boards act.

IN CONCLUSION

In the gathering and publication of these statistics the endeavor has been to give a fair presentation of facts, a knowledge of which is always beneficial. This annual presentation of the results of state license examinations has had a powerful influence on medical education and medical licensure in this country. We reiterate our acknowledgments to the state licensing boards for their ready cooperation and the complete reports which have been furnished. For the verification of all figures the reports and data furnished by medical colleges have been of much value. We have no doubt that the information here published will be of service not only to the medical colleges and to the state boards, but also to the public, since the end-result is better qualified physicians.

SCHOLARSHIPS IN MEDICAL SCHOOLS

As a further evidence that ample provision is being made for all worthy students, regardless of their financial status, during the last several years 336 scholarships have been established in 43 medical schools as shown in the following table:

SCHOLARSHIPS IN MEDICAL SCHOOLS

University of Alabama School of Medicine	66
Leland Stanford Junior University School of Medicine	3
University of California Medical School	3
University of Colorado School of Medicine *	1
Yale University School of Medicine	2
Georgetown University School of Medicine	3
Atlanta Medical College	12
Hahnemann Medical College and Hospital of Chicago *	6
Northwestern University Medical School	9
Rush Medical College, Chicago	6
University of Illinois College of Medicine *	6
Indiana University School of Medicine	10
Bowdoin Medical School	1
Johns Hopkins University Medical Department	6
University of Maryland School of Medicine	6
Boston University School of Medicine *	20
Medical School of Harvard University, Boston *	27
Detroit College of Medicine and Surgery	6
University of Minnesota Medical School *	1
University of Missouri School of Medicine	1
Washington University Medical School	1
Dartmouth Medical School	2
Columbia University College of Physicians and Surgeons	64
New York Medical College and Hospital for Women	2
Syracuse University College of Medicine	1
University and Bellevue Hospital Medical College	1
University of Buffalo Department of Medicine	1
University of North Carolina School of Medicine	1
University of Cincinnati College of Medicine	12
Western Reserve University School of Medicine	1
University of Oregon Department of Medicine	3
Hahnemann Medical College and Hospital of Philadelphia	3
Jefferson Medical College	1
University of Pennsylvania School of Medicine *†	3
University of Pittsburgh School of Medicine	2
Woman's Medical College of Pennsylvania	8
Medical College of the State of South Carolina	8
University of Tennessee College of Medicine	1
Vanderbilt University Medical Department	4
University of Texas Department of Medicine *	1
University of Vermont College of Medicine	9
Medical College of Virginia	10
University of Virginia Department of Medicine	2
Total in 43 medical schools	336

* Have loan funds also.

† Has fifty or more scholarships for graduates of Philadelphia high schools.

Loan Funds

The colleges above which are marked by an asterisk (*) also have loan funds for deserving but needy students. Such funds are available also at other medical schools, as follows:

Yale University School of Medicine, New Haven, Conn.
George Washington University Medical School, Washington, D. C.
Howard University School of Medicine, Washington, D. C.
University of Georgia Medical Department, Augusta, Ga.
Tulane University of Louisiana School of Medicine, New Orleans.
University of Nebraska College of Medicine, Omaha.
University of North Dakota School of Medicine, University, N. D.
University of Wisconsin Medical School, Madison, Wis.

The schools marked with an asterisk have also established loan funds for the assistance of worthy students who are without ample money to pay for their tuition and keep. Even under the higher entrance standard there are abundant opportunities for the poor boy, since the opportunities for working one's way through liberal arts colleges have never been more abundant than at the present time. Even though it is difficult for students to work their way through the medical school on account of the severity of the curriculum, nevertheless, in some of our best university medical schools, many students are paying all or part of their expenses as they go along.

MEDICAL STUDENTS IN GREAT BRITAIN

We have received from the General Medical Council the following tabular statement showing the number of students in actual attendance on courses of instruction in preparation for medical degrees or diplomas:

Topical Distribution	First Year Qualifying in 1921			Second Year Qualifying in 1920			Third Year Qualifying in 1919			Fourth Year Qualifying in 1918			Fifth Year Qualifying in 1917		
	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total	Men	Women	Total
January, 1917															
London (only)	217	174	391	183	133	316	71	54	125	229	44	273	425	51	476
England	602	325	927	374	210	584	175	99	274	341	68	409	539	78	617
Scotland	363	239	605	235	184	419	180	131	311	314	74	388	359	71	430
Ireland	481	110	591	378	78	456	217	31	248	196	22	218	190	15	205
Total	1449	674	2123	987	472	1459	572	261	833	851	64	1015	1088	164	1252
May, 1916															
London (only)	251	122	373	145	68	213	43	44	87	479	39	518	269	38	307
England	558	226	784	280	109	389	140	65	205	619	71	690	375	55	430
Scotland	404	311	715	267	154	421	213	80	293	258	55	313	366	74	440
Ireland	460	99	559	236	32	268	166	18	184	201	19	220	181	11	192
Total	1422	636	2058	783	295	1078	519	163	682	1078	145	1223	922	140	1062

The total number of students in attendance in May, 1916, was 6,103. The total number of students in attendance in January, 1917, was 6,682.—*Lancet*, London, March 3, 1917.

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SATURDAY, APRIL 14, 1917

THE BACTERIOLOGY OF POLIOMYELITIS

An interesting contention has arisen regarding the organism of poliomyelitis. In 1913, Flexner and Noguchi reported the finding of a micro-organism which they described under the term "globoid bodies" and which they stated seemed to bear an etiologic relationship to the disease.[1] Previous to their studies, numerous investigators had attempted to find a specific organism, but without success. More recently, in connection with the epidemic of 1916, Mathers, Nuzum and Herzog, and Rosenow, Towne and Wheeler[2] described an organism or organisms of a coccal nature and submitted evidence to show an etiologic relationship to poliomyelitis. What seemed like pure culture of such coccus was obtained by these workers from the brain and cord of something like twenty cases of acute poliomyelitis. The publication of this work apparently prompted Amoss[3] of the Rockefeller Institute to extend that on the globoid bodies. These bodies are obtained in cultures with great difficulty; as Amoss says, "Only those who have employed the original methods of cultivation have been rewarded with successful results." He qualifies this even further, saying:

> This is significant in respect to the etiology of poliomyelitis, for, while a variety of ordinary bacteria easily cultivatable has been obtained by various workers, the globoid bodies represent a peculiar species and thus far alone have sufficed to produce typical poliomyelitis in monkeys by intracerebral inoculation.

He points out, moreover, that the globoid bodies have been made to fulfil Koch's law. Amoss then discusses his recent studies of two additional cultures of these bodies obtained from the nervous tissues of monkeys in which experimental poliomyelitis was produced. He finds that the globoid bodies are refractory to artificial cultivation, but, after long cultivation outside the body, they acquire saprophytic properties, and then grow readily in a variety of mediums. Antibodies to the injections of cultures of the globoid bodies were only slightly produced in rabbits, and only occasionally produced in the monkey, when the cultures were injected into the central nervous system. The response was small and led to slight reactions of agglutination and complement deviation with the cultures. The serum of human beings gave no complement deviation with the antigen derived from the globoid bodies when the serum was taken in the acute or early stages of poliomyelitis. These bodies apparently present many analogies in cultural, immunologic and pathogenic properties to the *Spirochaeta pallida*. It should be pointed out here that the coccus which has been mentioned, when grown in the mediums in which the globoid bodies are grown, assumes globoid forms; like the infectious material in poliomyelitic virus it is filterable and resists the action of glycerin.

Amoss' work is supplemented by that of Bull,[4] another worker in the Rockefeller Institute. Bull insists that the organism reported by Mathers, Rosenow, Towne and Wheeler, and by Nuzum and Herzog[2] is a streptococcus. He points out that the findings of these authors conflict in several points with those of previous investigators in this country and abroad, all of which tend to exclude bacteria as the inciting agents of epidemic poliomyelitis. Bull says, "The stricter the conditions of bacteriologic asepsis, the less frequently were the cultures obtained."

The only other exception, Bull says, to the work of former investigators, besides the work of the authors just mentioned, is the "globoid bodies" which were found under strictly anaerobic conditions by Flexner and Noguchi.[5] He insists that the descriptions and pictures of lesions occurring in rabbits and monkeys succumbing to injections with the cocci isolated from cases of poliomyelitis in the published reports of Mathers, Nuzum and Herzog, and Rosenow, Towne and Wheeler, which they identify with the typical lesions present in poliomyelitis in the central nervous tissue of man and the monkey, are not convincing. The descriptions given by these authors, he believes, are more convincing than the pictures. Their organism produces lesions which he thinks are of another order from those occurring in human poliomyelitis or in monkeys inoculated with the filterable virus. He therefore studied cultures of streptococci from the tonsils in cases of poliomyelitis and from tonsils in non-poliomyelitic cases. Studies were made on animals, and the author states that he was not able to show any etiologic relationship between streptococci and epi-

1. Flexner, S., and Noguchi, H.: Jour. Exper. Med., 1913, **18**, 461.
2. Mathers, George: Some Bacteriologic Observations on Epidemic Poliomyelitis, THE JOURNAL A. M. A., Sept. 30, 1916, p. 1019; Jour. Infect. Dis., 1917, 20, 113. Rosenow, E. C.; Towne, E. B., and Wheeler, G. W.: The Etiology of Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, p. 1202; Science, 1916, **64**, 614; Observations on Immunity of Monkeys to Experimental Poliomyelitis, THE JOURNAL A. M. A., Jan. 27, 1917, p. 280. Nuzum, J. W., and Herzog, Maximilian: Experimental Studies in the Etiology of Acute Epidemic Poliomyelitis, THE JOURNAL A. M. A., Oct. 21, 1916, p. 1205. Nuzum, J. W.: Bacteriologic Findings in Cerebrospinal Fluid in Poliomyelitis, ibid., Nov. 11, 1916, p. 1437; The Production of an Antipoliomyelitic Serum, ibid., Jan. 6, 1917, p. 24.
3. Amoss, H. L.: The Cultivation and Immunologic Reactions of the Globoid Bodies in Poliomyelitis, Jour. Exper. Med., 1917, **25**, 545.
4. Bull, C. G.: The Pathologic Effects of Streptococci from Cases of Poliomyelitis and Other Sources, Jour. Exper. Med., 1917, **25**, 557.
5. Flexner, S., and Noguchi, H.: Jour. Exper. Med., 1913, **18**, 461.

demic poliomyelitis. The streptococci, on the other hand, all produced lesions in the rabbit which are not referable to poliomyelitis, but to streptococcus infection. It is difficult to analyze the article by Bull in detail since he considers the work of the investigators of the coccus without differentiating between the results of the various workers. He thus inferentially makes each responsible for the conclusions of all — perhaps a rather unfair method of presentation in view of the differences in the results and conclusions of the investigators mentioned. It may be pointed out, moreover, that Bull did not work with cocci isolated from the brain and cord of patients with poliomyelitis. The cocci which he did find in the spinal cord in monkeys dead of experimental poliomyelitis he regards as secondary invaders.

In contrast to the foregoing are articles published simultaneously by Blanton and by Rosenow and Towne.[6] Blanton's paper concerns a pathologic rather than a bacteriologic investigation. Observations as to the presence of organisms were made on sections of the cord. Organisms were found in the meningeal exudate covering the cerebrum and cerebellum in one case. These organisms were cocci. Some were quite small and appeared in chains, whereas others were seen singly or in pairs. Numerous sections of the cord were studied, and while the authors found it extremely difficult to convince themselves that they had found organisms, in several cases small bodies which varied considerably in size, and generally occurred in pairs, were identified.

Rosenow and Towne[6] have made further studies of the organism which they isolated. They studied the bacteriology of the central nervous systems of ten monkeys which succumbed to experimental poliomyelitis. As is well known, Rosenow's work on the pleomorphism of bacteria has shown that an organism which appears with certain characteristics under some conditions may possess entirely different characteristics when the conditions of growth are modified. The coccus which they isolated from the central nervous system of the monkey remains an ordinary sized diplococcus under aerobic conditions. Sometimes a capsule is demonstrable. Under conditions of low oxygen tension, the same organism may appear in minute form in twenty-four or forty-eight hour cultures in ascitic fluid plus tissue and oil, the medium in which the globoid bodies are grown. After this many factors appear to play a part in determining the type of the growth. With a suitable specimen of ascitic fluid and fresh sterile tissue, and with a scant initial growth, the organisms become small slowly by transverse fission. In such tubes there may be a pure growth of globoid organisms after from five to fifteen days. Rosenow and Towne conclude from these studies, therefore, that:

> The small globoid micro-organism which Flexner, Noguchi and their co-workers have considered to be the cause of experimental poliomyelitis has always, in our experience, been the result of the breaking down of large diplococci, which have been isolated from the central nervous tissues of each monkey infected with experimental poliomyelitis. These organisms have not been isolated from other tissues except lymph glands of poliomyelitic monkeys, nor from any tissue of normal monkeys. The mechanism by which the large forms become small has been demonstrated.

It appears, then, on the one hand, that the workers of the Rockefeller Institute are unwilling to grant that the coccus recently isolated from poliomyelitis by the workers mentioned bears relationship to poliomyelitis in man; they insist that it is merely a streptococcus and produces lesions which may be produced by streptococci in general. On the other hand, Rosenow and Towne claim that these streptococci under proper cultural conditions so modify their characteristics as to simulate the globoid bodies described by Flexner, Noguchi and Amoss, which the latter insist is the true causative organism of poliomyelitis. Obviously, the subject demands further investigation and confirmation. Certainly, if the work of Rosenow and Towne is confirmed, the differences in the assertions of the various experimenters will be quite satisfactorily explained. The fact remains that a very interesting coccus has been found in the brain and spinal cord in patients that have died from poliomyelitis — no one can deny that — but its relation to the disease is not yet determined. It may be a secondary invader or it may have a larger and more direct significance. In any event its discovery appears to be a distinct contribution to the bacteriology of the disease or diseases which have been called poliomyelitis.

6. Blanton, W. B.: An Anatomical Study of Fifteen Cases of Acute Poliomyelitis, Jour. Med. Research, 1917, **36**, 1. Rosenow, E. C., and Towne, E. B.: Bacteriological Observations in Experimental Poliomyelitis of Monkeys, ibid., 1917, **36**, 175.

THE CIVILIAN DOCTOR IN ACTIVE SERVICE

As noted in THE JOURNAL last week, if the president increases our army to its full strength as provided by the Defense Act of 1916, at least 1,000 additional physicians will be needed for the medical corps of the army. If an army of 500,000 additional men is to be raised, some 3,500 additional medical officers will be required, and if, as has been suggested, an army of 2,000,000 men is to be trained within the next two years, some 12,000 to 14,000 additional officers must be likewise trained with them. While this is only 10 per cent. of all the physicians in the country, it is a much larger percentage of those who are fully qualified by age, physical condition, etc., to become medical officers.

As this demand will take from the field of active practice a large number of physicians who heretofore have not given the matter any considerable study, it may be well to call attention briefly to the special character of some of the duties of the medical officer.

We would again emphasize that the duties of the medical officer are vastly different from those of the civilian physician. While there is no doubt that the physician who qualifies for the position of medical officer will soon be able to fulfil those duties and to meet the requirements of the work, there are, nevertheless, many special duties related to the handling of large bodies of men and the discipline of army life with which he will have to familiarize himself and which will require study and training. It must not be forgotten, incidentally, that it is not particularly the surgeon of great technical skill who is wanted, but the man of sane and conservative judgment — the surgeon, the physician and the sanitarian of judgment.

Of course, the first duty of the medical officer during mobilization is the physical examination of the recruit. This is perhaps by far the most important duty that the medical officer is called on to perform. On the physical condition of the recruit depends the mobility of the army, and the medical officer is held personally responsible for the enlistment of unfit men. Physical defects which appear of little importance at the time of examination become factors of vital importance when the soldier is placed under the stress and hardship connected with the duty in the field.

The next step is the initiation of sanitary measures to protect the new recruit. He should be protected immediately against smallpox and typhoid fever. He must be given instructions as to personal cleanliness and his surroundings must be made sanitary. In the vicinity of mobilization camps typhoid fever, malaria and the venereal diseases are prevalent. The administration of antityphoid serum cannot be begun too early, and the first dose should be given as soon as possible after the men arrive in the mobilization camps. Careful record must be kept of the inoculations and, in fact, of all the procedures which have been mentioned. The physician also sees daily at "sick call" those soldiers who feel the need of advice concerning minor ailments. At this time the physician must be especially on the watch for the initial symptoms and sporadic cases of the epidemic diseases. At this time, also, he can observe whether the food that the soldier is receiving is being readily assimilated and whether the soldier is personally clean.

The work of the physician in army life does not end with the care of the soldier. The troops bear a definite relationship to the civilian inhabitants of the community in which they may be quartered. It is the duty of the physician to be sure that neither body affects the other in a too severely unfavorable manner.

The physician is required also to undertake the care of the sick and wounded among the troops on the march, in camp, on the battlefield and after their removal from the battlefield. Arrangements for the transportation of the sick and wounded may devolve on the medical officer. He also is responsible for the ordering and securing of a supply of sanitary material, such as drugs, bandages and litters, which are necessary for the health of the troops and for the care of the sick and injured.

The foregoing is an attempt to paint in broad strokes an outline of the essential problems confronting the civilian physician who is called to active service with the army. About a year ago, at the time of impending hostilities with Mexico, a series of articles on this subject was published in The Journal.[1] Those articles included also a list of references to various books and manuals, such as the Army Regulations, the Manual for the Medical Department, Field Service Regulations, and Harvard Military Hygiene, with which the civilian physician who anticipates a call may familiarize himself in order to appreciate more readily his responsibilities and to grasp more quickly the finer details of the service. A second reading at this time is recommended.

THE NEED AND AVAILABILITY OF FATS

The war has taught many new lessons pertaining to the different branches of science and their application to the everyday arts: it has corrected many a mistaken notion of the past, and it has forced popular recognition of more than one conclusion which science has long inculcated but which the so-called practical man has sometimes failed to recognize. In the matter of diet we know today that a woman laboring in fields usually cultivated by men needs a ration liberal in proportion to her unusual expenditure of energy. It is now recognized that the food needs of active growing children pursuing their usual lively career are unexpectedly large. And continental experience has put an unexpected prominence on the presence of even a moderate allowance of fat in an otherwise acceptable dietary.

The shortage of fats in the countries of central Europe has been known for some time. Fats have never formed a particularly prominent part of the German diet, nor has their production been stimulated by the German agricultural scheme. As early as the autumn of 1915, in addition to the two meatless days per week, two fat-free days were introduced in the regimen of the German population. In the past, German writers on nutrition, following Voit, have rated the desirable quantity of fat in the daily ration at from 56 gm. (nearly 2 ounces) to 100 gm. (for men at hard work). It has been taught by them that with increase in the body's demand for available food fuel it is preferable not to increase too largely the carbohydrate intake, which is usually put at about 500 gm., but rather to add to the quota of fat in about the proportion indicated by the figures just quoted. An increment in fat can be obtained with far less increase in

1. What the Civilian Doctor Called to Active Service with the Army Should Know, The Journal A. M. A., Feb. 5, 1916, p. 425; Feb. 12, 1916, p. 508; Feb. 19, 1916, p. 571. Reprints will be sent on receipt of a stamped addressed envelope.

bulk than a comparable augmentation of carbohydrate-containing foods will permit. A gram of fat yields more than twice as much energy as the same unit weight of the other available nutrients.

Americans and Europeans have long been accustomed to a daily fat intake of at least 60 gm. (2 ounces) or more. In some of the nations of the Far East, decidedly less fat appears to enter into the day's ration. Taylor,[1] of the University of Pennsylvania, who has had exceptional opportunities for first-hand studies of the food situation in Europe in the present crisis, states that "the fat intake in Germany today is not over 20 grams of fat, animal and vegetable, per capita per day. This is certainly more than enough to cover the needs in fat-soluble vitamines. It is twice the Japanese intake of fat. But the fact remains that the people are hungry." Taylor states further that, in Germany prior to the war, butter was the fat of the rich, lard and margarin the fat of the poor. The per capita consumption was estimated at about 3½ ounces a day, of which nearly half was obtained by importation directly or indirectly.

In the United States, butter and cream are highly prized fat components of the daily diet among those who can afford them.

Bread and butter is a national "food staple." During recent months the price of butter, as well as of eggs, which contain a liberal content of valuable yolk fat, has increased to a level at which these sources of fat threaten to be no longer available in any abundance to the less well-to-do classes. Inevitably recourse must be had to cheaper sources of fats. Vegetable fats have for some time been competitors for recognition in the dietary. In addition to the original salad oil from the fruit of the olive tree, other oils are certain to attract consideration. An expert of the Department of Agriculture[2] has recently reported that even in the Mediterranean countries the total annual production of olive oil is only about half the amount of all the vegetable food oils used. Cottonseed, coconut and peanut oils already are utilized extensively in the United States, corn oil is beginning to appear in the retail stores, and the sunflower oil of Russia, soy bean, poppyseed, sesame, and numerous other oils of Europe are now making their appearance among American edible oils, or sooner or later probably will do so.

Some of the animal fats are peculiarly important for nutrition in that they carry a small amount of some accessory food substance or vitamin which is of peculiar value in growth and ordinary well being.[3] Such features presumably ought to be taken into consideration in placing a physiologic valuation on different fats. Aside from this, however, the question is sometimes raised as to whether different fats exhibit any noteworthy inequalities in respect to digestibility and consequent availability for nutritive needs. Recent investigations in the Office of Home Economics of the Department of Agriculture[4] showed that fairly large quantities of lard, beef fat, mutton fat, butter, olive oil, cottonseed oil, peanut oil, coconut oil, sesame oil, and cacao butter, incorporated in a simple mixed diet, can be well digested, the coefficient of digestibility being proportional to the melting point of the fat. It is now further shown that chicken fat, goose fat, brisket fat, cream, egg-yolk fat and fish fat are all well assimilated, and that they are satisfactory sources of fat for the dietary, at least in quantities up to about 90 gm. (3 ounces) per day. It is thus evident that preparedness in respect to our supplies of fats is not likely to be interfered with because of any limitations set by deficient alimentary utilization of any of the most readily obtainable of these foods. The importance of forestalling a national shortage in these foodstuffs is therefore accentuated.

1. The facts quoted are taken from a series of exceptionally illuminating papers by Taylor, A. E.: The Control of Food Supplies in Blockaded Germany, Saturday Evening Post, Feb. 17 and 24, and March 3, 1917.

2. Bailey, H. S.: Some American Vegetable Food Oils, Their Sources and Methods of Production, U. S. Dept. Agric. Yearbook, 1916.

3. McCollum, E. V., and Davis, Marguerite: Jour. Biol. Chem., 1913, **15**, 167. Osborne, T. B., and Mendel, L. B.: Ibid., 1913, **16**, 423; 1914, **17**, 401.

4. Langworthy, C. F., and Holmes, A. D.: Studies on the Digestibility of Some Animal Fats, Bull. 507, U. S. Dept. Agric., March 24, 1917; Digestibility of Some Vegetable Fats, U. S. Dept. Agric., Bull. 505, Feb. 13, 1917.

STATISTICS OF STATE BOARD EXAMINATIONS

We publish this week, for the fourteenth consecutive year, tabulated statistics based on official reports of examinations conducted by state medical licensing boards. Other information having a direct bearing on state boards and methods of registration has been included to enable those interested better to interpret the results. Reports have been received from all state boards, so that the statistics are complete and dependable.

The casual reader may not appreciate the conditions which make the publication of the data important. Medical education and medical licensure in this country are controlled by the fifty individual states (including Alaska and the District of Columbia), each of which, in these matters, is organically independent of the others. In the fifty states are as many different practice acts, providing for sixty-two different examining and licensing boards, no two of which entirely agree. No legislative provision exists for a national control, for cooperation between the boards, or for uniformity of standards. The number of states in which the public is well protected against illiterate and incompetent physicians is still comparatively small, although improvements are rapidly being effected, as shown in Table M. Nevertheless, taking the country as a whole, much confusion and inefficiency still exist in the licensing of physicians. If, for valid reasons, a physician has had his license revoked in one state, it is still possible for him to go to another, often merely crossing a state line, where he may secure a

license. If he is caught again, he may as promptly transfer to a third state. To correct these conditions, an exchange of accurate information and a closer cooperation among state boards is essential. The collection of statistics such as are published this week is a step toward this end. The Council on Medical Education of the American Medical Association is glad to place at the service of all state boards its clearing house of information on these matters.

The collection and the publication of these statistics were begun by The Journal in 1903, but have been continued as one of the functions of the Council on Medical Education of the American Medical Association since 1905. Every report received from state licensing boards is carefully checked, duplications are avoided, errors corrected, and the statistics rendered accurate and reliable. Through the possession of complete alumni lists of medical colleges, the Council is in position to avoid charging a college with a failure which may have been erroneously accredited to it. This information regarding medical graduates has also led to the discovery of instances in which fraudulent credentials have been presented to state boards. Attention of the board concerned has been called to the facts, and in several instances the licenses so issued have been promptly revoked.

These statistics have had a much greater effect than that rendered by a mere numerical report of physicians examined. In many states, splendid systems of record keeping are found where formerly no records whatever were kept, or where the systems were imperfect. They have also furnished abundant argument for practical tests in state license examinations.

The publication of these statistics has had a marked influence on medical colleges. Where previously medical faculties were unaware of the weakness in their methods of teaching, these statistics show how frequently graduates fail at the state license examinations. For example, in the four years that Table D, showing the nonrecognition of medical colleges, has been published, conditions in the colleges have been improved so that the number fully recognized has increased from thirty-one to sixty. The colleges have made marked improvement in their equipment, and better teachers have been secured and better methods adopted.

These statistics have their greatest value when studied in connection with other data collected by the Council on Medical Education and published in The Journal and in the Council's reports. The state board statistics are based on reports received direct from state boards, and are made more accurate and reliable through data furnished by medical colleges. The statistics published this week, therefore, have been made possible only through the cordial cooperation of both the state boards and the medical colleges, and for this cooperation we again express our acknowledgments.

Current Comment

RESEARCH IN MEDICAL SCHOOLS

An important report[1] in this issue of The Journal shows that of the twenty-six foundations for medical research in this country, seventeen, or nearly two thirds, are in connection with medical schools. The report also intimates that the "great growth of the spirit of research in this country" accompanied "the phenomenal development which medicine has undergone in recent years." In fact, the growth of medical research has been in direct proportion to the increase in the number of full-time, salaried professors in medical schools. This increase has been influenced, to a certain extent at least, by the inclusion of the possession of full-time teachers and the conduct of research work as one of the ten requisites in the basis[2] on which the Council on Medical Education rated medical schools in its first published classification. Since full-time teachers were urged chiefly in the laboratory branches, the development of research has been most rapid in that division of the medical school. Only a few medical colleges were amply financed to provide full-time professors in clinical departments and, therefore, only a few have all departments, laboratory and clinical, carrying on active research. With larger numbers of full-time clinical professors, medical research in medical schools will attain to a higher degree of efficiency than is possible where that research is in isolated laboratory departments. There cannot fail to be better results where all departments of the medical school are interested and cooperating in research, since then any department has the advantage of all the resources of the medical school; any discovery may be tried out under adequate facilities and safeguards and its value established or disproved. In fact, a modern medical school, with its skilled faculty; with its laboratories thoroughly equipped for medical instruction and research, and with an abundance and variety of clinical material at its command, constitutes the ideal arrangement for medical research. On the other hand, the medical school cannot reach its highest efficiency in teaching unless it is permeated by the spirit of investigation that is engendered by research. The student cannot fail to be benefited. He appreciates better the importance of the fundamental medical branches; that the training in the medical school merely admits him to the field of medicine with its limitless possibilities for usefulness, and that his future success depends on investigation, on keen observation, on accuracy of judgment, and on the skill with which he applies his knowledge. Graduates of medical schools in which research is a prominent feature of the work will be better able than those of other schools to cope with the multiform problems which confront the modern practitioner of medicine.

1. "Medical Research in Its Relation to Medical Schools." A Report by Drs. Frederic S. Lee, Richard M. Pearce and W. B. Cannon, composing the Committee on Medical Research of the Association of American Medical Colleges, read at the Annual Meeting in Chicago, Feb. 6, 1917.

2. "Essentials of an Acceptable Medical College." Report of the Council on Medical Education to the House of Delegates of the American Medical Association, June 6, 1910, The Journal A. M. A., June 11, 1910, p. 1975, paragraph 12 and p. 1976, paragraph 8.

THE DUTY OF OFFICERS OF STATE AND COUNTY MEDICAL SOCIETIES

The Advisory Commission of the Council of National Defense and the General Medical Board are appealing for the assistance and cooperation of officers of state and county societies in the endeavor to secure the large number of physicians urgently needed. A subcommittee of the General Medical Board has been created to cooperate with state and county societies in this work. Undoubtedly when the officers of these societies realize how necessary their cooperation is, they will regard it as a duty and will lend a willing hand and hearty cooperation when called on. The officers of even remote county societies are extremely important links in the chain that makes effective the organized medical profession of this country.

THE MOBILIZATION OF THE MEDICAL PROFESSION

The development of modern medicine and surgery has established the importance, in any military activities on a large scale, of a competent and adequate staff of medical officers. Present day surgery, hygiene and sanitation have adequately demonstrated their immediate and practical value in the handling of large bodies of troops. The mobilization of the physical forces of the nation now going on concerns the medical profession directly and offers to it an opportunity greater than any it has heretofore had in our national history. Physicians are needed for this most important and valuable service. In a nation like ours, based essentially on peaceful occupations rather than on militarism, reliance must always necessarily be placed on volunteers, drawn from the ranks of civil life, rather than from a special class trained to military service. No duty which confronts the medical profession today is more important than that of supplying, from the ranks of the American medical profession, such medical skill and service, both in quality and quantity, as the present need may require. Discussion of various phases of medical preparedness has been going on for many months past. It is gratifying to know that whatever may be the needs of the future, our country is probably today better prepared to meet any medical emergencies which may arise than at any previous time in its history. Various activities in this direction have from time to time been recorded and commented on in THE JOURNAL. One of the most important problems is the instruction of civilian physicians in the details of military hygiene and sanitation. On this subject, the Clinical Club of Albany, over a year ago, devised a plan which is worthy of the careful consideration of groups of physicians desiring to prepare themselves for military service. The resolutions passed by the University of Michigan Medical School and the Alabama State Board of Health are efforts to solve the question of the increased demand for professional services which is bound to follow the diverting of large numbers of physicians from civilian to military work. The plan proposed by the Maryland State Committee on Medical Preparedness is an effort to minimize the practical difficulties which will confront the physician who is asked to give up, for the time being, his private practice for public service. These various plans are worthy of the careful consideration of physicians, both as individuals and as members of medical organizations. The present situation calls for cool judgment and deliberate action in order that the medical profession may perform well its full duty.

THE MORE RECENT GRADUATES DESIRED

According to news from Washington, the quota necessary to fill the present vacancies and requirements of the Army Medical Corps will be drawn from among those who graduated in 1912 to 1916. The total number that would be included in such a list would be approximately 19,000. The list of graduates in the five years mentioned, and also for 1917, is as follows:

MEDICAL COLLEGE GRADUATES

	From Colleges in Class			
	A	B	C	Totals
1912.....	2,790	1,063	629	4,482
1913.....	2,539	1,050	392	3,981
1914.....	2,626	686	282	3,594
1915.....	2,629	688	219	3,536
1916.....	2,630	695	193	3,518
1917*.....	2,641	625	101	3,367
Totals....	15,855	4,807	1,816	22,478

* Seniors

As stated last week, there is an immediate need of additional physicians for the Medical Corps of the Army, and for the Medical Corps of the Navy. For these positions preference will be given to young physicians. The Army Medical Corps insists on a year's internship in a hospital after graduation; the Navy, however, is not now insisting on this, but is recognizing 1917 graduates. The young man who takes any of the positions now open is availing himself of a great opportunity for life work. The Army and Navy medical services offer a chance for a broad general training, an opportunity to do research in time of peace and, perhaps, of early promotion as never existed before.

MEDICAL COLLEGES AND MEDICAL PREPAREDNESS

In the present national crisis, the conservation of our sources of supply in medical men is quite parallel to the maintenance of productivity in other lines. A medical school is, in a sense, a factory, the output of which is absolutely essential to the maintenance of the armed forces in the field. Particular importance attaches, therefore, to the report of the medical school committee of the Medical Board of the Council of National Defense, printed elsewhere in this issue. No better example could be given of the necessity of a wise foresight in this matter than the experience of England. In the first enthusiasm at the outbreak of the great war, medical students and members of the faculties of medical schools were not only permitted but encouraged to enlist in the line or in various sanitary organizations. No one foresaw the disastrous consequences of this policy until the war had been in progress a year. With the disorganization of the medical schools, there were at that time no graduates to fill the junior grades of the rapidly growing army

nor men to take the vacancies as interns in the various civil hospitals. Both medical schools and civil hospitals were disorganized. It then became necessary to withdraw both medical students and teachers from the army and send them back to England to study with the handicap of a year's waste motion, a blow from which the British Sanitary Service has never completely recovered. The problem with us is quite clear. Medical schools and civil hospitals must be kept in operation. Means to hold premedical students, to speed up production, and to turn over all unnecessary men for the Medical Officers Reserve Corps must be devised. Several constructive suggestions are embodied in this report. Medical schools may adopt what has become known as the Italian plan — a wise policy devised by the Italians to profit by England's unfortunate experience. The clinical faculties with the medical students were sent to base hospitals at the front. Service for the army was performed by caring for the sick and wounded while instruction was continued at the same time. Without loss of energy men were graduated directly into the medical corps of the army as the war progressed. One or two schools in this country already have organizations of this type under way. The thing of fundamental importance is to remember that the medical schools must be kept operating. In every other way and by every other means, the national emergency demands that they cooperate in overcoming the present grave shortage of medical men. This can be accomplished by reducing the teaching staff to a minimum, working through vacations to increase the product, or by the Italian plan, which meets the needs both of the service and the future at the same time.

TIME FOR MAKING APPLICATION FOR SCIENTIFIC EXHIBIT EXTENDED

In the Association News in this issue will be found an announcement extending the time for applications for space in the Scientific Exhibit to May 1. This is done in order that all those having scientific material of value for such an exhibit may be given an opportunity to apply for space. The Scientific Exhibit this year will be in the Belvedere or roof garden of the Hotel Astor, probably the most beautiful quarters which it has ever had. Most of the available space has already been assigned. Very little is left, so that anyone desiring space should make application at once in accordance with the directions given under Association News.

Poverty in China.—Even the passing traveler in China is impressed with the all-enveloping and well-nigh universal poverty. In the police census of Changsha the total population by count was 270,604, including 583 foreigners. Of these, 52,744 were classed as extremely poor, requiring some help from the government practically all the time to prevent actual starvation. An additional 67,687 were classed as moderately poor, requiring government aid in such emergencies as flood, short crops and drouth to prevent starvation. These two classes combined represent 44 per cent. of the total population which regularly each year requires some aid to avoid starvation. And Changsha is among China's richest, most powerful and most cultured cities.—Dr. Alfred C. Reed, *Scientific Monthly*, January, 1917.

Medical Mobilization and the War

THE GENERAL MEDICAL BOARD OF THE ADVISORY COMMISSION, COUNCIL OF NATIONAL DEFENSE

In THE JOURNAL last week, p. 1060, appeared a review of the work already done in the way of medical preparedness through the medical member of the Advisory Commission of the Council of National Defense, Dr. Franklin H. Martin, and his co-workers and committees. The declaration of war made necessary still more active work on the part of the Advisory Commission. For this reason certain of the members of the commission were authorized to appoint a committee, or board, to cooperate with them. Dr. Martin appointed the following as a General Medical Board of the Council of National Defense to cooperate with him "in coordinating civilian military medical activities and to advise in regard to fundamental medical problems in regard to the armed forces of the country":

Dr. Franklin H. Martin, member of the Advisory Commission, Council of National Defense, chairman.
Dr. F. F. Simpson, chief of Medical Section, Council of National Defense, vice chairman.
Surg.-Gen. William C. Gorgas, U. S. Army.
Surg.-Gen. William C. Braisted, U. S. Navy.
Surg.-Gen. Rupert Blue, U. S. Public Health Service, President, American Medical Association.
Col. Jefferson R. Kean, director of Military Relief, American Red Cross.
Dr. William H. Welch, Professor of Pathology, Johns Hopkins University, Baltimore.
Dr. William J. Mayo, Rochester, Minn.
Dr. Victor C. Vaughan, Dean of University of Michigan Medical School, Ann Arbor, Mich.
Dr. Richard P. Strong, Professor of Tropical Medicine, Harvard University, Boston.
Dr. Edward Martin, Professor of Surgery, University of Pennsylvania, Philadelphia.
Dr. George H. Simmons, Editor JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, Chicago.
Dr. John M. Flint, Professor of Surgery and Dean, Yale University, New Haven.
Dr. Stuart McGuire, Professor of Surgery, Medical College of Virginia, Richmond.
Dr. John Young Brown, Professor of Surgery, St. Louis University School of Medicine, St. Louis.
Dr. Charles H. Mayo, President-Elect, American Medical Association, Rochester, Minn.
Dr. Thomas Huntington, Professor of Surgery, University of California, San Francisco.
Dr. H. A. Royster, President of the Southern Surgical Association, Raleigh, N. C.
Dr. Charles H. Peck, Professor of Surgery, University of New York, New York.
Dr. Winford Smith, Superintendent, Johns Hopkins Hospital, Baltimore.
Dr. Frederic A. Besley, Professor of Surgery, Northwestern University, Chicago.
Dr. George W. Crile, Professor of Surgery, Western Reserve University, Cleveland.
Mr. Earl Phelps, Sanitary Engineer, Washington, D. C.
Dr. Edward C. Kirk, Dean, The Thomas W. Evans Museum and Dental Institute School of Dentistry, University of Pennsylvania, Philadelphia.

First Meeting of General Medical Board

The General Medical Board held its first meeting, April 9, in Washington. At this meeting there was a general review of what already had been accomplished and a discussion of what remains to be done. Some eight subcommittees were appointed to facilitate and make more effective the work now so pressing, and to meet the various problems, all more or less urgent, the solving of which requires special knowledge. Space prevents giving the composition of these committees this week. Two of the committees already have made preliminary reports—both of practical and immediate importance, both being unanimously adopted by the General Medical Board. One concerning medical schools is commented on editorially, the other relates to hospitals. Both are in part reproduced herewith:

The Medical Schools and Medical Preparedness

Following is the report of the Medical School Committee, of which Dr. J. M. Flint of Yale Medical College is chairman, to the General Medical Board:

Your committee after consultation with the surgeon-general begs leave to submit the following report: In your efforts to solve the urgent problem before this board and assist the surgeon-general in supplying an adequate number of medical officers for the army and navy, it is important that this country should not repeat England's blunder at the outbreak of the war in permitting the disorganization of the medical schools either by calling the faculties into active service or sanctioning the enlistment of medical students into any of the line organizations. Ordinary foresight demands that we face the possibility that the war on which we have entered may last for years. Medical schools to supply trained men for the future as well as the present emergency must be kept in active operation under any circumstances. While aiding to the uttermost in overcoming the present shortage of men, the necessity of keeping the source of supply open emphasizes the importance of conserving our raw material. Therefore, men now in college looking forward to medicine as a career should be made to understand that it is their patriotic duty to the nation at this time to continue their studies and enroll in the medical school of their choice. Furthermore, no medical student who has not completed three years of medical work should be permitted to give up his course as the country needs his trained and not his untrained service.

There are, however, ways in which the medical schools can help the present situation. The following suggestions are made for your consideration and action:

(1) Medical schools should be prepared to graduate senior medical students promptly in case of need. The faculties should urge all graduates who can be relieved of their obligations as interns in civil hospitals to enroll in the Medical Corps of the Army and Navy.

(2) Medical schools should be encouraged to consider as a form of service the Italian plan by which base hospital units can be organized through the Red Cross. These military hospitals carry with them the clinical faculty and students as medical personnel. This type of organization meets two ends—practical help can be rendered to the army or the navy in time of war and instruction may be continued at the base. This permits the graduation of men directly into the junior grades of the army after the most practical form of military instruction.

(3) Fourth year students may be allowed to substitute in special cases, service in a base hospital for the fourth year in the hospital at home when opportunities are offered for instruction in such military institutions.

(4) Medical schools that do not adopt the Italian plan should be prepared to reduce the faculties to the minimum required for routine work and enroll all men so liberated in the Medical Officers Reserve Corps.

Hospitals and Medical Preparedness

The hospital committee of the General Medical Board—Dr. Winford Smith, superintendent of Johns Hopkins Hospital, chairman—made a rather full report on the matter of hospital conservation. The committee called attention to the fact that the release of medical men from civil duties for service in the army and navy is of vital importance at the present time, and recommended that the General Medical Board communicate at once, by telegraph and by letter, with all general hospitals of one hundred beds or over, urging the present needs and suggesting that hospital authorities reorganize their staffs with a view to releasing as many men as possible, the hospitals to be asked to report to the General Medical Board:

"The second matter considered and recommended was that a selected list of hospitals be prepared, with reference to size, location near terminal facilities or strategic points, as for example the hospitals of the important points along the Atlantic and Pacific Coasts and the Northern and Southern Borders. Information should be obtained from these hospitals as to what facilities they would place at the disposal of the Government in case of need, the possibilities of expansion, amount of ground available for expansion, whether maintaining convalescent branches or not and the ease with which water, heating and sewage connection could be made in the event of expansion. This list would supply to the Surgeon General's office a list of approved hospitals, available for convalescent military hospitals or for such other purpose as might be necessary.

The third point considered was the ultimate need of hospitals or facilities for handling special lines of medical and surgical work, such as neurological, orthopedic, urological, shell shock hospitals, etc. It is felt that by listing the special lines for which provision should be made and the hospitals equipped for such service, valuable information will thus be made available and that the committee in performing this work may also serve as a buffer between the Surgeon General and his Staff and the large number of those who may have pet projects to propose.

Your Committee suggests that if it meet with your approval authority be given to proceed with the work as outlined. The Committee is ready to extend its functions as occasion demands."

1st. The members of the Staff needed to carry on the work in the civil hospital.

2d. The members of the present Staff who can be spared. This second group to be divided into:

A. Those now members of the Reserve Corps.

B. Those not members, but who are willing to become members of the Reserve Corps.

C. Those not members, who require persuasion.

As soon as this list becomes available, it is to be placed in the hands of the surgeon-general. It is believed that such a list will be of value: 1. As representing an organization which will safeguard the civil hospitals, which is of vital importance. 2. It will supply a list of available men, who are willing to enter the Reserve Corps. 3. It will supply a definite list of available men on whom pressure should be brought to bear. It is believed that the handling of the matter in this way will allay the fears with regard to the interests of civil hospitals, which now is a deterrent factor, and release a large number of men, who would otherwise not be available or who would be slow to respond. It would be of great assistance to the surgeon-general's office.

The committee recommended that those men who are selected to remain at home, as represented by approved lists, should be furnished with some emblem to signify that they are recognized as serving their country by performing the home duties.

Will Compulsory Service Be Necessary?

It is reported that if a sufficient number of young medical men do not voluntarily offer their services for the immediate needs of the regular Army and Navy Medical Corps, compulsory service may follow. This statement is not official; it is simply a fairly well authenticated rumor. It would indeed be a splendid exemplification of the high type of medical men available in this country if a sufficient number of the younger men would volunteer promptly, making even the mention of compulsory service unnecessary. The upper age limit is 32.

Obtain Men for the Hospital Corps of the Navy

The navy needs at once at least 2,000 men for its Hospital Corps. Every physician in the land should immediately interest at least one young man in this service. From the mass of applicants that will be thus brought forward the required number of competent men can be enrolled without delay. Here is a patriotic duty that every member of the profession, young and old, can perform that hardly requires him to step outside of his daily routine of life. Do your bit, and do it today.

Young men between 18 and 25 years of age will find in the Hospital Corps of the Navy every opportunity to serve their country, and they will receive fair pay and have varied duties and exceptional opportunities for study. In close association with the doctors of the navy they will have to do with first aid to the injured; the care of the sick; surgical procedures; and chemical, bacteriologic and pharmaceutic methods, both on ships at sea and at hospitals and stations ashore.

Service may be either by enlistment as a hospital apprentice for a period of four years or by enrollment as a hospital apprentice in the Naval Reserve Force for the period of the war.

Ask your postmaster where the nearest Navy Recruiting Office is located, and send your candidates there. Instruct every candidate to ask for the doctor and to tell him that he desires to join the navy as a hospital apprentice.

Let the response to this call show the patriotism of our profession.

The Albany Plan

In his address before the House of Delegates at the Detroit session (THE JOURNAL, June 17, 1916, p. 1938), Dr. Vander Veer described the work being carried on by the Clinical Club of Albany for the education of its members in military surgery and hygiene. This included a preliminary course of reading, lectures and discussions on the various subjects necessary for the training of the medical military officers, the preparation of pamphlets and typewritten

outlines comprising digests of the various subjects studied and the formulating and working out of definite problems such as might arise during conditions of actual warfare. This plan, begun in November, 1915, by a small group of Albany physicians, has since come to be known as the "Albany Idea," and has been developed and issued in pamphlet form so that it can be taken up and followed out by groups of physicians or local medical societies. The same method could, in the opinion of Surgeon-General Gorgas, be applied to the entire country. Pamphlets on organization and on the duties of medical officers based on the army regulations and the manual of the medical department have been prepared and distributed to the members by the Clinical Club. Each member has been given special topics for study on which he has been expected to prepare papers for presentation and discussion. In addition, various problems covering contingencies which might arise in time of war have been presented, parts of which have been assigned to individual members, orders issued and reports returned as in actual service. For example, problem one assumes that a portion of the Atlantic Fleet has been defeated and Boston taken by the enemy, who has also succeeded in effecting a landing on the New Jersey coast and has routed the force of the United States troops sent against them, resulting in the capture of New York City. The United States troops are assumed to be slowly retreating from Boston and New York, converging on Albany as a base. It is further assumed that the water supply of the city is in danger of being contaminated. The members assigned to different parts of the problem then undertake to determine the exact sources of the municipal water supply, the daily amount required, how it is stored and distributed, how wastage can be prevented, the possible sources of contamination and methods of prevention, the most vulnerable points for crippling the water supply and how they can be guarded, possible methods of fire control in case the usual supply was destroyed, an emergency water supply, simple methods of purifying an emergency supply, methods of distribution and other related points. A second problem assumes the presence in or near Albany of 100,000 refugees and endeavors to work out methods by which Albany's resources could be utilized in caring for these people so that their own health and that of the community could be guarded. A third problem assumes the occurrence of two battles nearby and the sending of 10,000 wounded to Albany with the consequent need of providing quarters, distributing and caring for the wounded and securing the supplies needed for their care. This problem involved practically a complete survey of the hospitals and buildings capable of being converted into temporary hospitals, the local supply of medical men, nurses, dressings, drugs, instruments, operating room supplies and hospital equipment. A fourth problem assumes the use of Albany as a base and the location of large concentration camps near the city with the prevalence of typhoid fever, requiring the investigation of the camps, their sewage and refuse disposal, general policing, water supply, etc., the examination and immunization of all persons in the camps, the careful inspection of the water, food and milk, the elimination of flies, etc. The pamphlet also contains an outline of the plan of organization of the army and especially of the medical department, the duties of medical officers and instructions regarding the examination of troops. Copies of this pamphlet can be obtained from Dr. Joseph A. Cox, 35 Clinton Avenue, Albany, N. Y., the chairman of the committee. It is hoped that its distribution will stimulate interest and provide a working plan for sanitary surveys elsewhere similar to those made in Albany.

The Medical Reserve Corps

It should be clearly understood by those interested, now that war exists, that medical officers of the Reserve Corps are subject to call and must respond if called. This is as it should be. It would be embarrassing to the surgeon-general's office, and to those responsible for the medical departments of the army and navy, to discover, when the emergency came, that they had been depending for support on what finally proved to be a "broken reed." If any members of the Reserve Corps are under misapprehension as to this point, they should consider their responsibility now, before it is too late, and act accordingly.

Surgical Squads in the European War.—Our Paris correspondent this week (page 1136) calls attention to what would appear to be a practical method of economizing the surgeon's time in active warfare.

Belgian Relief.—The commission for relief in Belgium announces that for the week ending April 4, $101,130 was received for the Belgian relief fund, making a total contribution from the United States since the beginning of the war of $10,636,647. The commission is arranging that Asst. Director Prentiss Gray and three American accountants shall remain in Brussels for a month or more to instruct the new Dutch commissioners in their work.

Ambulances Donated.—Mr. Jacob H. Schiff has donated five motor ambulances to the New York Red Cross for use with military base hospitals organized in New York.

Georgia Survey.—The officers of the Medical Reserve Board of Augusta began a sanitary survey of the city, March 26, to determine the fitness of Augusta as a site for an army base hospital and mobilization camp.

Hookworm Infection.—It is reported from Camp Wilson, San Antonio, that there is widespread infection from hookworm among the troops from Alabama, Mississippi and Texas, but that the disease is now under control.

Twenty-Five Thousand Dollars to Equip Hospital Base.—A gift of $25,000 from Mrs. Henry L. Collins of Sewickley Heights will be used to equip the University of Pittsburgh Hospital Unit. This will enable the Red Cross organization to care for 500 wounded.

Minnesota Hospital Unit.—The University of Minnesota has offered to the government a base hospital unit, of which Dr. Arthur A. Law has been placed in command. One half of the cost and equipment has been supplied by Drs. William J. and Charles H. Mayo of Rochester, and the other half by contributions of business men of the state.

Health Facilities Offered the United States.—Health Commissioner Haven Emerson, New York, has announced that all stocks of serums and vaccines of the department laboratories at Otisville will be available for the federal government in case of war. He also has offered to supply the government with a corps of food inspectors if desired.

Promotions in Guard.—The following promotions have been announced in the New York Guard: Lieut.-Col. William S. Terriberry, chief surgeon of the New York Division, has been made chief surgeon, N. Y., N. G.——Majors Edward R. Maloney, M. C., Walter C. Montgomery, M. C., and William H. Steers, M. C., have been promoted to lieutenant-colonel.

Medicomilitary Instruction.—A course of instruction arranged for the members of the senior class of the University and Bellevue Hospital Medical College was given by Major Frederick S. Macy, M. C., U. S. Army, at Governors Island, N. Y., April 9 to 14, inclusive. The course consisted of lectures on military surgery and hygiene and instruction in military drill.

Philadelphia Active for Medical Preparedness.—The Philadelphia County Medical Society has arranged plans for service in time of war. Dr. J. Norman Henry was appointed chairman and Dr. William H. Walsh, secretary of a special committee.——April 4, a general meeting was held at the Academy of Natural Sciences, at which Lieut.-Col. Henry Page, M. C., U. S. Army, and Lieut.-Com. Robert A. Bachmann, U. S. Navy, delivered addresses.——As a result of a meeting in the Acadamy of Natural Sciences, April 5, at which Lieut.-Col. Henry Page, U. S. Army, and Surg.-Gen. Robert A. Bachmann, U. S. Navy, urged members of the Philadelphia County Medical Society to enlist in the Medical Reserve Corps of both branches of the service, several hundred have already enlisted and others have signified their desire to do so.

Police Surgeons Mobilized.—Announcement has been made from New York City by Chief Surg. Edward T. Higgins that 150 physicians and surgeons had volunteered their professional services under the direction of the police department. An organization by boroughs has been perfected and Dr. Higgins is obtaining the necessary equipment for field services. The expense of this equipment is to be defrayed by women interested in the work.

Alabama Favors Early Graduation for Medical Service.—At a meeting of the Alabama State Board of Health, held April 2, resolutions were adopted to recognize as having completed the prescribed course, students graduated early from the school of medicine of the University of Alabama, or any other Class A medical school whose diplomas are recognized by the board, who enter the Federal service. Such students will not be denied the privilege to examination by the board by reason of having failed to spend in their medical college

courses for the senior year the amount of time prescribed by the board.

Mobilization of New York Hospitals.—On April 8, Mayor Mitchell of New York announced the appointment of a committee on hospitals of the Mayor's Committee on National Defense. Dr. S. S. Goldwater, consultant on health and hospitals of the Board of Estimate and Apportionment, is its chairman. Preliminary steps have been taken to mobilize the resources of the municipal hospital of New York, including the department of public charities, Bellevue and Allied hospitals and the department of health. Various city departments and all the hospitals of New York City have been asked to take membership on this committee. The committee may be addressed care of mayor's office.

Philadelphia War Hospitals and Supplies.—Mrs. Charles C. Harrison, wife of the ex-provost of the University of Pittsburgh, and treasurer of the Women's Working Committee of the South-Eastern Chapter of the American Red Cross, has raised $50,000 for the equipment of the American base hospitals in or near Philadelphia.——The Merion Civic Club has announced the opening, in the near future, of the "first distinctly Red Cross House in the United States." A site for the headquarters has been purchased by the society.——At a special meeting of the North-Western General Hospital staff, Governor Brumbaugh and Mayor Smith were offered the use of the hospital for the care of wounded soldiers and sailors, and plans were made for a course of public instruction in first aid work and emergency nursing.

Base Hospital Ready.—The Johns Hopkins Base Hospital is rapidly being brought up to the standard required by the government and within two weeks it is expected that the listing of attendants, the assemblage of supplies and the full muster of officers will be completed. The necessary funds for supplies and equipment have been provided. The roster of twenty-five physicians is complete; fifty nurses and twenty-five nurses' aids have volunteered for service. Dr. George Walker will be adjutant to Dr. Winford H. Smith, Dr. John M. T. Finney will be chief of the surgical division and Dr. Thomas R. Boggs will direct the laboratory division. Fourth year students of the medical school of the university have volunteered their services as well as a large percentage of the third year men.

Illinois Committee on Medical Preparedness.—The following committee has been appointed to coordinate the medical colleges and organizations of the state: Dr. L. L. McArthur, chairman; Dr. D. A. K. Steele, president, Illinois Division Medical Reserve Corps and dean of Illinois College of Medicine; Dr. William L. Noble, president, Illinois State Medical Society; Dr. A. A. O'Neill, president, Chicago Medical Society; Dr. John M. Dodson, dean, Rush Medical College; Dr. J. P. Cobb, dean, Hahnemann Medical School; Dr. Alfred Deroulet, dean, Loyola University Medical School; Dr. G. E. Wineken, secretary, Chicago College of Medicine and Surgery; Dr. Richard H. Street, president, Illinois Homeopathic Society; Dr. Albert J. Ochsner, University of Illinois; Dr. Wilbur H. Gilmore, secretary, Illinois State Medical Society, Mount Vernon; Dr. Fred A. Besley, Northwestern University Medical School; Dr. Charles E. Kahlke, Hahnemann Medical School; Dr. Dean D. Lewis, Rush Medical College; Dr. James F. Percy, Galesburg, and Dr. Arthur R. Kendall, dean, Northwestern University Medical School, secretary of the committee.

Preparations for War in New York Hospitals.—In addition to the American Red Cross Hospital units that have been organized in connection with the larger hospitals of New York, a plan is announced for the establishment in connection with the Medical Department of Columbia University of a hospital of 1,000 beds to be kept in readiness for any emergency. The proposed site of this hospital is the old Columbia Oval at Bainbridge Avenue and East Gunhill Road, the Bronx. The plan as submitted to the trustees of the university was developed by Dr. J. Bentley Squier, Jr., and endorsed by President Butler and Dr. Samuel W. Lambert, Dean of the College of Physicians and Surgeons. It is proposed to make this hospital a center for training in military surgery, and that all future students graduating in medicine shall have received training in military surgery. The present matriculates of the College of Physicians and Surgeons will receive this training at once. The hospital will be equipped to send field units, consisting of men, materials, tents and all necessary accessories, to any point where their services may be needed, not only in war but to the scene of any accident requiring such service.——St. Luke's Hospital has evolved plans making that institution a base hospital, similar to the American Ambulance Hospital in Paris. The capacity of the hospital will be doubled by the erection of temporary buildings, and the medical and nursing staff will be enlarged. The Columbia University trustees have offered the St. Luke's Auxiliary a portion of South Field as a site for the temporary hospital. A corps of orderlies will be recruited from among medical students.——The trustees of the Cathedral of St. John the Divine, located near St. Luke's Hospital, have announced their intention of offering the Cathedral building as a pavilion hospital.——The New York Ophthalmic Hospital has offered the use of its buildings and equipment to the secretaries of war and navy. This is the first hospital devoted exclusively to the treatment of diseases of the eye, ear, nose and throat to offer its services to the government.

Resolutions Passed by the Faculty of the University of Michigan Medical School.—The faculty of the University of Michigan Medical School on April 2, 1917, passed the following resolutions:

1. It is the opinion of the faculty of the University of Michigan Medical School that in meeting the demands for medical officers in the national service, the military authorities should give first preference for enlistment to the members of the medical classes of the past two years, viz.: 1915 and 1916.

NOTE:—These young men have recently finished their medical courses and having taken in part or altogether their hospital training, should have the latest and best information in scientific medicine, and not having as yet established themselves in practice, are best fitted to be selected for military service.

2. In view of the probably urgent demands for trained medical men, the faculty of the University of Michigan Medical School desires to place itself on record as being ready and willing to make its courses of instruction continuous through the summers of 1917 and 1918. This proposition will be submitted to the various state boards of licensure for their approval.

NOTE:—If this provision goes into effect, a week after the close of the present session, the session of 1917-18 will begin. Those who are now Juniors will become Seniors and may be graduated in January, 1918.

NOTE:—In taking this step, not only the military demands upon the medical profession, but civil demands as well are taken into consideration.

3. Taking into consideration the future needs of the country for trained medical men, it is the opinion of the faculty of the University of Michigan Medical School that it is advisable for the undergraduate medical students to complete their course of instruction and not to enlist.

4. The faculty of the University of Michigan Medical School recommends that not less than two hours per week be set aside for the military drill of undergraduate students, and that in addition to the ordinary infantry drill, we recommend training along the lines developed by the Clinical Society of Albany, and known as the "Albany Plan."

NOTE:—The medical officer should first of all be a soldier. This is necessary in order to make him most efficient as a medical officer.

5. That copies of these resolutions be furnished for suggestions of approval or disapproval to the following bodies:

(1) The surgeons general of the army and navy.
(2) The National Medical Committee on Preparedness.
(3) The National Research Council.
(4) The faculties of other medical schools.

6. That a list of the graduates of the classes of 1915 and 1916, with their standing while in the school and their present addresses, be sent immediately to the surgeons general of the army and navy.

Punishing Patriotism: A Suggested Method of Meeting This Evil.—Undoubtedly in the past civilian doctors who have been patriotic and who have served their country in the army or navy have been in a measure punished for such service by finding their practice dissipated and gone on their return home. The knowledge of this has naturally acted in preventing many a physician entering the Officers' Reserve Corps of the United States at this time.

To meet this situation the Maryland State Committee on Medical Preparedness, of which Dr. Gordon Wilson, Baltimore, is secretary, has devised the following plan to be presented at the annual meeting of the state society (Medical and Chirurgical Faculty), to be held in April.

This plan has already been endorsed by the Baltimore City Medical Society.

The committee proposes to have offered the following resolutions:

1. *Resolved*, That the Medical and Chirurgical Faculty of Maryland recognizes the patriotism of those members of the medical profession resident in Maryland who volunteer for the service of the U. S. Government, and in appreciation of this we recommend that should these members of the profession be called into active service, the doctors who shall attend their patients should turn over one third of the fees collected from such patients to the physician in active service or to his family.

2. *Resolved*, That the secretary of the society shall have prepared letter blanks according to the form attached, to a number sufficient to supply those physicians who are called into active service, with a sufficient number so that they can send a filled-out form letter to each patient, a carbon copy going to the doctor who has agreed to look after the physician's practice, and a second carbon copy to be sent to the secretary of the state society.

The secretary of the state society is instructed to file the carbon copies received by him, and on notification by a physician that he has terminated his service with the government and has resumed his practice, the secretary of the state society shall then send out to each of the patients of this physician whose names and addresses he has received in the filed letters a letter stating that the physician has resumed the practice of medicine, and requesting the patient in the name of the society to recognize the physician's patriotism by summoning him should he be in need of medical attention.

This method is the only one devised which can in any way meet the situation that confronts the physician who is patriotic, and who is penalized for his patriotism by the loss of his practice. By this method the profession at large is "put on its honor," the patients of the physician are urged to retain his services, and this urging is done, not in the physician's name, but in the name of the profession and as a patriotic duty.

It is proposed, should these resolutions be adopted, to send a description of the plan to every member of the profession, a copy of the form letter, and also two cards, one to be signed by the physician endorsing personally the first resolution, and the other an application for admission to the Medical Officers' Reserve Corps.

Below are a specimen of the proposed form letter and two cards.

PROPOSED FORM LETTER

(Regular Letter-Head of Medical and Chirurgical Faculty.)

M———————

Street———————

Postoffice———————

Dear M———————: As a member of the Reserve Corps of the United States Army (Navy), I have been ordered into active service by the Government, and on that account I am writing to you of this fact, so that, in case of illness, you may summon some other doctor to attend you. In my absence Dr. ——— of ———, Telephone No. ———, has kindly consented to attend my patients, and I can heartily recommend him.

Sincerely, ———————

Resolution adopted by Medical and Chirurgical Faculty of Maryland:

"Resolved that the Medical and Chirurgical Faculty of Maryland recognizes the patriotism of those members of the medical profession resident in Maryland who volunteer for the service of the U. S. Government, and in appreciation of this we recommend that should these members of the profession be called into active service, the doctors who shall attend their patients should turn over one-third of the fees collected from such patients to the physician in active service or to his family."

Please present this letter to any doctor whom you may call in to attend you.

CARDS

I agree to abide by resolution adopted in relation to fees for attendance on patients of doctors ordered into active service for the government.

In the remote chance of misunderstandings or disagreements arising under this resolution I agree to submit the facts to the board of censors of the society and abide by their decision.

(Signed) .....

RESERVE CORPS

I hereby make application for appointment to membership in Reserve Corps of U. S. Army (scratch one out).

Navy

(Signed) .....

Address .....

Date .....

Medical News

(Physicians will confer a favor by sending for this department items of news of more or less general interest; such as relate to society activities, new hospitals, education, public health, etc.)

ARKANSAS

Legislative Notes.—The Arkansas legislature has passed a bill creating a bureau of sanitation under the state board of health, and providing that all hotels or restaurants where meals and sleeping accommodations are furnished for transient guests shall be under the control of this bureau.——The legislature has also appropriated $2,000 for the medical department of the state university, and has authorized the building of a state charity hospital.

COLORADO

Fee Splitting Forbidden.—The Colorado legislature has passed the bill introduced by Senator Knauss prohibiting the division of fees by physicians, surgeons, chiropractors, midwives or chiropodists.

DISTRICT OF COLUMBIA

A Warning Against Exhaust Gases from Gasoline Engines.—Every person who takes out a license to operate an automobile, either as owner or chauffeur, in the District of Columbia, is to receive hereafter a leaflet warning him of the dangerous character of the gases given off by gasoline engines. The same leaflet will be distributed among the operators of gasoline launches and wherever gasoline engines are to be found.

To Prevent Measles by Publicity.—Because of the unusual prevalence of measles and of the recognized failure of ordinary official methods for the control of that disease, the health officer had had printed and distributed about 30,000 leaflets describing measles and telling what the parent and the schoolteacher can do to prevent it. Distribution has been made in the public and private schools and the Sunday schools, through the public library and its various branches, and through all available agencies.

GEORGIA

Elected Hospital Trustees.—Drs. Walter E. Barber and Thomas D. Longino have been elected trustees of Grady Hospital.

Personal.—A banquet was given by the medical profession of Atlanta, March 9, in honor of Dr. John G. Earnest, marking the fiftieth anniversary of his entrance into the practice of medicine.

ILLINOIS

Memorial Service for Dr. Sachs.—Memorial services for the late Dr. Theodore B. Sachs were held at Naperville, April 2, by the Jewish Consumptive Relief Society.

Personal.—Dr. J. Morgan Sims, Collinsville, formerly coroner of Madison County, is under treatment for neurasthenia in a sanatorium in St. Louis.

Director of Public Health Appointed.—Governor Lowden has announced the appointment of five members of his cabinet created under the Consolidation bill. Those appointed include Dr. C. St. Clair Drake, director of the Department of Public Health. The director of the Department of Registration and Education has not yet been announced.

Chicago

Campaign of Sanitation.—At a mass meeting held at the Cort Theater, March 30, a campaign was inaugurated against infantile paralysis. Drs. Edwin W. Ryerson and William A. Evans delivered addresses. The plan contemplates a committee to look after the sanitary conditions in every city block, a precinct captain to watch over the various block guardians and a ward supervisor and committee for each ward.

Consulting Staff for Isolation Hospital.—Mayor Thompson has appointed on the consulting staff for the new Municipal Contagious Disease Hospital Drs. Isaac A. Abt, Merlin Z. Albro, Robert A. Black, Jacob F. Burkholder, Rachael Hickey Carr, Howard R. Chislett, Arthur M. Corwin, Frederick G. Dyas, Roy R. Ferguson, Nathaniel A. Graves, Clifford C.

Grulee, Elmer E. Henderson, Julius H. Hess, Henry E. Irish, Richard H. Street, Theodore Tieken, Charles A. Wade, W. Henry Wilson and F. Robert Zeit.

INDIANA

What the Legislature Did.—The Chiropractic bill providing for a separate examining board was killed by the legislature; also the bill to modify the medical laws. Three hundred and fifty thousand dollars was appropriated for the medical department of the university, but the governor refused to approve the appropriation. The all time county health officer bill and the bill providing for the medical examination of schoolchildren were both defeated. Bills providing for health insurance, the regulation of venereal diseases, the prohibition of the sale of habit-forming drugs and the requiring of health certificates for a marriage license were also killed.

IOWA

Chiropractic Bill Defeated.—A bill providing for the licensing of chiropractors has been killed in the house.

MARYLAND

Personal.—Dr. Lewis A. Sexton, who has been superintendent of the Johns Hopkins Clinic for several years, has accepted the position of superintendent of the Hartford Hospital, Hartford, Conn., and will take up his new duties within the month.

Medical Building.—The Young Men's Christian Association at Saratoga and Charles streets, Baltimore, has been sold for more than $200,000. The building will be torn down and on its site the new medical building, a steel and concrete gothic structure, eight stories in height, to cost about $300,000, will be erected.

Meetings.—The second of a series of public health lectures under the auspices of the Medical and Chirurgical Faculty of Maryland was held in Osler Hall, Baltimore, April 10. The topic under discussion was the mental defective. "How the Public Schools of Baltimore City and the Counties Attempt to Meet the Problem of the Mentally Retarded Child" was the subject for the afternoon session, and "How the Criminal Courts Attempt to Meet the Problem of Those Mentally Irresponsible" was discussed at the evening session. Among the speakers were Dr. Henry H. Goddard, director of the Research Laboratories, Vineland, N. J.; Dr. Joseph P. Byers, executive secretary of the National Committee of Provision for the Feeble-Minded, Philadelphia; the various judges of the supreme bench of Baltimore; Dr. M. Bates Stephens, superintendent of the state board of education of Maryland; Prof. Charles J. Koch, superintendent of the Baltimore city public schools, and Dr. C. Macfie Campbell of the Phipps Psychiatric Clinic.

MICHIGAN

Speaks in Muskegon.—At the meeting of the Muskegon-Oceana County Medical Society, held at Hackley Hospital, Muskegon, March 30, Dr. Adelbert M. Moody, Chicago, spoke on "Laboratory Methods in Diagnosis."

Medical Department and Public Library.—The Genesee County Medical Society has obtained the consent of the board of education of Flint to use a portion of the public library for a medical department, for the use of local physicians.

Hospital Changes Name.—The president of the Children's Free Hospital Association, Detroit, announces the change in the name of the institution to the Children's Memorial Association. This does not mean that the free care of sick children is to be abolished by the hospital.

Graduate School in Detroit for University.—The regents of the University of Michigan have adopted a resolution providing for taking over the Detroit School of Medicine as a graduate school, provided $1,000,000 can be raised by the latter to insure the state against loss.

Health Work in Detroit.—Dr. James W. Inches, formerly mayor of St. Clair, has been appointed health officer of Detroit until July 1, to fill out the term of Dr. William H. Price, resigned.——Dr. Guy L. Kiefer, formerly health officer of Detroit, has been appointed consulting health officer.——The scarlet fever situation in Detroit has been serious, a total of more than 1,240 cases having been reported up to March 27. The hospital capacity of the city was overtaxed, and the demand for nurses was far in excess of the possibility of supply.

Personal.—Dr. Leo C. Donnelly, Detroit, has returned to the United States after a year's service in French Base Hospital, No. 43, bis., back of the Somme front.——Dr. Richard M. Olin, Caro, has been elected secretary of the state board of health, to succeed Dr. John L. Burkart, Big Rapids.——Dr. Roscoe C. Main has resigned as health officer of Marquette, and has been succeeded by Dr. Arthur K. Bennett.——Dr. Eugene Smith was the guest of honor at a dinner given by the Ophthalmological Club and the Oto-Laryngolocial Club of Detroit, March 21, at the Hotel Statler, in celebration of the semicentenary of practice of Dr. Smith in Detroit.

MINNESOTA

Personal.—Dr. Frederick Barrett, mayor of Gilbert, is ill with smallpox.

Meningitis.—The old Maternity Building of the St. Paul City and County Hospital has been prepared for patients suffering from spinal meningitis.

Quarantine Hospital for Minneapolis.—The city council, March 9, endorsed the request of $75,000 by the Board of Charities and Correction for the purchase of land at Seventh Avenue South and Fifth Street for a quarantine hospital.

Hospital News.—It is announced that a new wing will be added to the Norwegian Lutheran Deaconess Hospital, Minneapolis, to cost $50,000, for exclusive use as a maternity hospital, and that the Fairview Hospital will build an addition to cost $100,000.——The new Kelly Hotel building, Rochester, was opened, March 21, as a hospital, under the management of the Roberts Hotel Company. It is now known as the Stanley.

Smallpox.—The smallpox epidemic at Eveleth is believed to be under control. About 8,000 people of Eveleth and its environs have been vaccinated.——Eleven of the sixteen cases of smallpox in Duluth have been traced to two children who arrived in the city from Eveleth several days before.——During February there were 130 cases of smallpox in Minneapolis and 249 cases in the entire state.——Ernest Amundson, Perham, is said to have been sentenced to ten days in the work house by Judge Bardwell of Minneapolis on the charge brought by Dr. Harry M. Guilford, city health commissioner, that he had wilfully exposed the public to the disease. Amundson was arrested as he stepped out of the quarantine hospital after having been confined two weeks with smallpox.

NEW JERSEY

Venereal Diseases Reportable.—The legislature has passed a bill to compel the reporting of the state department of health of all persons suffering from venereal diseases. The record is not to be published nor is it to be a public record. Its purpose is to conserve the public health by empowering the state department of health to establish such quarantine measures as may be necessary, at the same time insuring privacy and protecting the victims of these diseases from exposure and exploitation. The legislature has also passed a bill making it a misdemeanor for any one affected with a venereal disease to marry.

NEW YORK

To Investigate Sickness.—A bill providing for a commission to investigate sickness among wage earners in New York creates a commission of five members of the legislature and four others, including wage earners, employers and physicians. The state commissioner of health and the industrial commission are authorized to cooperate in recommending methods for the better protection of workingmen and their families in time of sickness. The creation of the commission has the approval of the advocates of the Mills bill for health insurance and also of those who are not yet ready to see such legislation passed.

New York City

Orthopedic Surgeons Organize.—Orthopedic surgeons and representative men of the several orthopedic hospitals of the city met, March 29, at the New York Hospital for Ruptured and Crippled, on the invitation of Dr. Virgil P. Gibney, and effected an organization for the surgical care and treatment of orthopedic patients in the event of hostilities. Dr. Gibney was elected president and Dr. George Barrie, secretary. A committee on organization was appointed.

Health Campaign Among Negroes.—The death rate among negroes in this city is almost double that of the city at large. In 1916, the negro death rate was 24.4 per thousand as compared with the general city death rate of 13.7 per thousand.

Colored babies born in this city have only half the chance of living through the first year that white babies enjoy. The department of health will conduct an educational campaign during the last two weeks in April in cooperation with the National League on Urban Conditions Among Negroes.

Hospital Social Service.—The New York Conference on Hospital Social Service will be held at the New York Academy of Medicine, April 18, at 8:15 p. m. The subject of the evening is "The Control of Gonorrhea and Syphilis." The program includes "Survey of Four Years' Clinical Work," by Dr. Henry A. Fisher; "Dispensary Control," by Dr. Alec Nicol Thomson, Brooklyn; "Community Control," by Mr. Frank Osborn, New York Social Hygiene Society, and "Dispensary Follow-Up," by Miss Grace Barclay, Johns Hopkins Hospital.

Personal.—Dr. Lee K. Frankel, third vice president of the Metropolitan Life Insurance Company, has been appointed a member of the Council on National Defense.——Dr. Hermann M. Biggs, who recently returned from France, delivered an address to the third and fourth classes of the University and Bellevue Hospital Medical College, in the amphitheater, April 5, detailing his experiences and the medical conditions as they exist in France.——Dr. Linsly R. Williams, now deputy commissioner of the New York State Board of Health, has been appointed first deputy to the New York City Department of Health.——Dr. Edward W. Ryan, formerly in charge of the American Hospital in Belgrade, has been asked by the Serbian government to reorganize the sanitary and relief work north of Saloniki. His work will be to put on a permanent basis the beginning made by the American Sanitary Commission in fighting typhus in Serbia two years ago.

OHIO

Ohio Scores Clean Records.—The Ohio legislature has adjourned with a clean record on public health subjects. The osteopathic, optometry and Christian Science bills were defeated. The bill amending the workmen's compensation law, abolishing the $200 limit for medical, surgical, nurse and hospital attendants, was passed. The model health insurance bill of the American Association for Labor Legislation was introduced, but was later withdrawn, and a substitute bill introduced providing for the establishment of a state commission to study health insurance, appropriating $25,000 for such investigation and directing the commission to report to the legislature in 1919.

OKLAHOMA

Hospital for University Medical Department.—The legislature has passed a bill appropriating $200,000 for the building and equipment of a hospital at Oklahoma City, to cost $200,000 and to be conducted under the supervision of the medical department of the state university. The Tulsa County Medical Society has formally endorsed this action of the legislature.

Personal.—Dr. Frank Woolard, Welch, sustained a fracture of the arm by the overturning of his automobile recently.——Dr. John S. Stults, Olustee, was accidently shot by a hunter while driving in the country recently.——Dr. Dumont D. Howell, Nowata, sustained painful injuries recently in a collision between automobiles.——Dr. Okey S. Somerville, Bartlesville, has been appointed physician of Washington County, and Dr. John R. Collins, Nowata, has been appointed county physician of Nowata County.

OREGON

Legislative Appropriations.—The legislature appropriated $1,000 for the medical department of the state university. A bill was passed reducing the appropriation of the state board of health from $30,000 to $25,000 for the next two years. A bill allowing osteopaths to do minor surgery was also passed.

PENNSYLVANIA

Philadelphia

Hospital Incorporated.—The Physicians' General Hospital has been incorporated with a capital stock of $50,000. The name of Henry S. Sultzer appears as the incorporator.

Tuberculosis Dormitory.—A new dormitory for tuberculous patients will be erected this summer at the Byberry Farms, completing the work being done to relieve congestion in the Philadelphia General Hospital. The dormitory will have accommodation for 300 patients.

Personal.—Dr. Lina D. Schwatt has been appointed physician to the insane department for the feebleminded at Byberry.——Dr. William J. Enders has been elected medical superintendent of the Protestant Episcopal City Mission Home for Consumptives in Chestnut Hill.

Roentgen-Ray Department Opened.—The Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases has opened a new Roentgen-ray department, equipped in part through the memorial fund to Miss Maria Gouverneur Mitchell, daughter of the late Dr. S. Weir Mitchell, one of the founders of the hospital. Dr. Ralph S. Bromer is in charge.

To Combat Infantile Paralysis.—The Child Federation of Philadelphia, cooperating with Dr. Wilmer Krusen, director of public health and charities, began a campaign, March 24, to combat infantile diseases believed to be caused by flies. An appeal has been made to the various institutions and social charitable agencies to provide inspectors for the 6,000 stables in the city, which are breeding places for flies.

Symposium on Occupational Diseases.—The meeting of the Philadelphia County Medical Society, April 11, was devoted to a discussion of the industrial or occupational diseases. Dr. Joseph W. Schereschewsky, U. S. P. H. S., presented the main paper of the evening. Other speakers included Mr. John Price Jackson, commissioner of labor and industry, Harrisburg; Dr. Walter G. Hudson, Wilmington, Del., medical director of the DuPont Powder Works, and Dr. T. Grier Miller.

Medical Institutions.—The Babies' Hospital of Philadelphia, April 2, elected Dr. Charles A. Fife, president of the board, other members being Drs. Joseph S. Neff, Arthur Newlin, Joseph Sailer, John F. Sinclair and James E. Talley. Eleven thousand dollars has been contributed toward the purchase of a site for a dispensary building.——Public lectures for women in the course on "Health Problems of Every Day Life," at the Woman's Medical College, North College Avenue and Twenty-First Street, include one on April 11 by Dr. Ellen C. Potter on "The Health of Schoolchildren" and another on April 18 by Dr. Arthur A. Stevens on "Conditions and Care in Old Age."

SOUTH DAKOTA

State Legislature Acts.—The chiropractic bill failed to pass. A law forbidding the division of fees was enacted.

TENNESSEE

Disciplinary Laws for Physicians Enacted.—The legislature has passed a bill forbidding fee splitting; also one punishing physicians for signing false statements.

TEXAS

Cult Bills Defeated.—Both the optometrist and chiropractic bills have been defeated.

Measles Must Be Reported.—The attorney general has ruled that, it being a matter of common knowledge that measles is a contagious disease, each case should be reported by the physician in charge to the local health officer in the manner prescribed by the sanitary code.

Personal.—Dr. Cleve C. Nash, Palestine, has been appointed chief surgeon of the International and Great Northern Railway.——Dr. Edmund B. Parsons, March 23, was appointed chief surgeon of the International and Great Northern Railway Hospital at Palestine.——Dr. Kincy J. Scott, assistant city physician of Fort Worth, has resigned to accept a position with the Daughter of the King Hospital.

State Quarantine Station Located.—Dr. William B. Collins, state health officer, accompanied by Lieut.-Col. William J. Barden, C. E., U. S. Army, has gone to Sabine to select the location of the new Texas State Quarantine Station on the Sabine-Neches Canal. An appropriation of $65,000 was made by the last legislature for this station, which will serve the ports of Sabine, Sabine Pass, Port Arthur, Port Neches, Orange and Beaumont.

Licenses Revoked.—The Texas State Board of Medical Examiners reports that on Dec. 6, 1916, the license of Dr. Ella M. Maddix, Dublin, was revoked, on the grounds of drug addiction and for having been convicted of violating the Harrison Narcotic Law, and that on March 13, 1917, for similar reasons the license of Dr. W. F. Gordon, Fort Worth, was revoked. It was also stated that on March 20, 1917, the license of Dr. William A. Link, Fort Worth, was revoked, on the ground of his having been convicted of a felony and sent to the penitentiary.

UTAH

Sectarian Bills Defeated.—The chiropractic bill was killed in the house by a vote of 23 to 20. The drugless healers' bill was killed by the sifting committee, as was the bill requiring health certificates before marriage. Bills regulating doctors' fees, creating a state department of health and amending the medical practice act so as to permit chiropractors to practice were killed in the house by striking out the enacting clause. Practically no public health legislation of any importance was enacted.

WASHINGTON

Governor Vetoes Bills.—A drugless healer bill and an amendment to the medical practice act were both vetoed by the governor.

WEST VIRGINIA

Constructive Laws Passed.—Legislature passed bills establishing a tuberculosis sanatorium for colored people, amending the medical practice act by increasing the requirements for a license forbidding the division of fees and providing for the licensing of chiropodists by the state board of health council.

WISCONSIN

Industrial Service.—The Northern Paper Mills, Green Bay, have established an industrial service department under the direction of Dr. Ralph M. Carter, Green Bay, and a registered nurse. Complete medical and surgical care for employees and their families will be furnished, and a thoroughly equipped dispensary with reading, rest and recreation rooms is under construction.

Septic Sore Throat in Galesville.—The twelfth death from septic sore throat at Galesville occurred, March 22. Physicians of the state board of health have discovered six infected cows in a herd of twenty-six, which supplied milk for Galesville.

Personal.—Dr. Oscar Lotz has been appointed a member of the State Board of Medical Examiners, to fill the unexpired term of Dr. John M. Beffel, Milwaukee.——Dr. Henry C. Werner has been appointed supervisor of the State Institution for Feebleminded Children at Union Grove, Racine County.——Dr. John R. McDill, Milwaukee, who recently returned from Germany, was the guest of honor at a dinner and smoker given by the Press Club, March 24.——Dr. Michael E. Corbett, Oshkosh, entertained the Oshkosh Medical Club and the Winnebago County Medical Association at his home, March 17.——Dr. Max Bornstein has been elected secretary of the Milwaukee County Division of the Medical Reserve Corps, U. S. Army.

CANADA

Drugless Healers in Saskatchewan.—An amendment to the Medical Profession Act is before the legislature of the Province of Saskatchewan. It provides that an applicant for a drugless practitioner certificate must show that he has attended a course of lectures pertaining to his work extending over a period of four years and embracing at least five months of each year, satisfactory evidence of which shall be produced if required.——The council shall also admit every person registered under the osteopathic act at the time of the coming into force of this act: Any person who shall produce to the registrar a certificate under the hand of the registrar of the University of Saskatchewan as having passed satisfactorily the hereinafter mentioned examinations for drugless practitioners: provided that such person shall restrict his practice to the method of treatment cited in his license.

Personal.—Col. John T. Fotheringham, C. M. G., Toronto, is returning to Canada, having been appointed director of Invalid Services in Canada.——Col. Frederick W. Marlow, who resigned the post of A. D. M. S., Toronto Military District, will shortly sail for England, where he will be given an important post in the Canadian Medical Service.——Capt. Edward Ryan, formerly superintendent of the Rockwood Hospital for Mental Diseases, Kingston, Ont., and who has been chief of the psychopathic ward of the Ontario Military Hospital, Orpington, England, will succeed Major Frederick J. Munn as medical officer of the Military Hospitals Commission in the Toronto District.——Lieut.-Col. P. Walter W. McKeown, Toronto, who has been attached to the pension board for nearly two years in England, has left Shorncliffe to become attached to the Kitchener Hospital, Brighton, England.——Dr. William A. Harvie, Regina, Sask., who went overseas with the Saskatchewan Medical Unit, has been appointed a member of the Standing Medical Board.

Hospital News.—The medical staff of the Regina General Hospital are having a memorial tablet placed in a public place in the hospital in memory of the late Dr. John A. Cullum, who was a member of the staff, and who was killed in action in France.——The Saskatchewan Hospital Unit, Stationary Hospital No. 8, is located at Hastings, England.——The number of invalid soldiers now being cared for in Canada by the Canadian Hospitals Commission is nearly 5,000. The convalescents number 3,913, of whom 2,104 are in convalescent hospitals, and 1,809 outpatients. Consumptives number 520, including 193 "camp" men. All but eleven are being treated in special sanatoriums for tuberculosis. Sixty-seven men are in the hospitals for the insane, besides six outpatients, while there are 196 men in ordinary hospitals and other institutions.——The Canadian soldiers in hospitals in the United Kingdom on March 9 numbered 15,060, including 467 officers, and consisted of 9,389 sick and 5,194 wounded; 103 are in tuberculosis institutions.——The Ontario government has increased its grant to the hospitals of the province from $1 per patient per day to $1.20.

GENERAL

Physician Practicing Without License.—It is reported that Godfried Leonhard Hagen-Berger has been found guilty of practicing medicine without a license before the Dade County Court at Miami, Fla., and was sentenced to pay a fine of $50 or to serve ninety days in jail.

Lane Medical Lectures.—The Lane Medical Lectures for 1917 will be delivered by Dr. Simon Flexner of the Rockefeller Institute. During the week beginning Monday, October 8, there will be five lectures and they will be given on consecutive evenings. The subject of the series will be "Physical Basis and Present Status of Specific Serum and Drug Therapy."

National Child Labor Conference.—The thirteenth National Conference on Child Labor closed its session at Baltimore with the firmly established conviction that whatever war measures this country is obliged to adopt, there should be no let-down in the standards for child protection. Forms of child labor to be found in every state in the Union and yet not controlled by the federation law were discussed at some length, and among other subjects, suggestions were made for the codification of all child welfare laws and the need of federal aid to elementary education as the means of equalizing the educational opportunities of children throughout the country.

Public Health Service Personals.—Asst. Surg.-Gen. Henry R. Carter has been ordered to proceed to New Orleans and other places in the southern states to supervise the study of malaria.——Surgs. Joseph W. Schereschewsky, George L. Collins and Frederick C. Smith have been directed to inaugurate an investigation of the textile industry in Philadelphia and vicinity.——Drs. Thomas Parran, Jr., Washington, D. C.; Henry Stoll Mustard, Charleston, S. C.; Joseph Davis Applewhite, Winona, Miss.; John Wilson Tappan, El Paso, Texas; Roy Preston Sandidge, New York; Paul Darwin Mossman, Berea, Ky.; Ralph Chester Williams, Montgomery, Ala.; Julius Stanley Shourds Gardner, Washington, D. C., and Richey Laughlin Waugh were appointed and commissioned as assistant surgeons, March 22.

Bequests and Donations.—The following bequests and donations have recently been announced:

Methodist Hospital, Indianapolis, a donation of $1,500, by Mr. and Mrs. Verling Stanley, Lapel, as a memorial to their only daughter, who died last December.

Pennsylvania Medical Missionary Society, a bequest of $5,000, by the will of Miss Sarah Benners.

St. Christophers Hospital, Philadelphia, a bequest of $3,000, by the will of Marianne Biddle.

Library of the Women's Medical College of Pennsylvania, Philadelphia, the library and the hospital of the Women's Medical College of Philadelphia and the surgical instruments of the late Dr. Pearce Kintzing, Baltimore.

St. John's Riverside Hospital, Yonkers, N. Y., $1,000, and Homeopathic Hospital and Maternity, Yonkers, N. Y., $5,000 in memory of Eva Smith Cochran, by the will of Mrs. Mary Lewin T. Smith.

Columbia University, for the maintenance of the new school of dentistry, a gift of $7,055 from an anonymous benefactor.

Medical School of Columbia University, in memory of her son, Dr. Charles Wood McMurtry, the entire furnishings of his library, valued at $7,000, by Mrs. Clara L. McMurtry.

The Medical School of Columbia University, a donation of 600 volumes, valued at $3,000, by Dr. Frederic S. Lee.

The Medical School of Columbia University, $2,500, for the maintenance of the Coolidge Research Fellowship of Medicine for 1917-1918, by Mrs. Frederick S. Coolidge.

FOREIGN

Social Insurance for Parturients in Italy.—The *Policlinico* states that arrangements have now been made for aid to prospective mothers in wage earning families. They are each to receive 40 lire, about $8. The funds for this are to be provided from a fund to which the wage earner contributes 1 lira annually, the factory owner 1.25, and the state 12 lire. The insurance society makes up the balance to 40 lire at each childbirth.

Deaths in the Profession Abroad.—**G. Argento,** professor of surgery at the University of Palermo, aged 70. He always took a prominent part in public health matters and the hygiene of the hospitals throughout Sicily.——**D. de Sandro,** instructor in special pathology at the University of Naples.——**A. Gordon,** at one time professor of physiology at the University of Havana, but long retired from active practice.——**M. O. Morejon** of Madrid, aged 83. Under his initiative the hospital and dispensary service of Madrid was organized as the Cuerpo Municipal de Beneficiencia and thus first placed on a systematic and sound basis.——**J. Riedinger,** professor of orthopedics at the University of Würzburg, aged 52.

Death of Welander.—Our Scandinavian exchanges bring obituary notices of Edvard Wilhelm Welander, the Swedish authority on syphilis and dermatology in general, aged 77. He was professor of skin and venereal diseases at the University of Stockholm until his retirement on reaching the age limit. He was the first to affirm that inunction courses of mercurial treatment are in reality inhalation courses, and hence that it is possible to dispense with the inunctions if the mercury is inhaled from a surface smeared with it. He had his patients wear a kind of apron over the chest, on which the mercury was smeared. His name is connected with the Welander homes for children with inherited syphilis. He founded the first one on a small scale at Stockholm, and it proved so successful in insuring thorough and systematic treatment for the children and in obviating infection of others that it has been constantly enlarged and others have been founded. There are Welander homes now in Christiania, Copenhagen, Berlin and Vienna.

PARIS LETTER

PARIS, March 15, 1917.

The War

RATIONAL USE OF THE SURGEONS, AND FUNCTION OF SURGICAL SQUADS

In a previous letter (THE JOURNAL, Feb. 17, 1917, p. 558) I referred to certain changes made in the organization of the surgical department of the army. The undersecretary of state of the military health service has given notice as to what these changes are to be. The new organization proposes to counteract the dearth in the number of surgeons, whose skill and mastery of technic are well known, by (1) making it possible to transport the surgeons with greater facility to places at which there is greatest need for their services, and (2) by forming surgical squads capable of rendering immediately the best of service, no matter where they are called. With this end in view, the undersecretary has decided to surround each surgeon with a staff of especially selected and competent assistants. This group will form a surgical squad or operating unit which may be sent anywhere as a surgical reinforcement. Each squad or unit will be composed of a surgeon and assistant surgeon, an anesthetist and two nurses. The anesthetist is a medical adjutant (lieutenant or sublieutenant), a medical auxiliary (corresponding to the grade of adjutant) or an auxiliary pharmacist. The two special nurses are either medical students or pharmacist students, preferably the former. The assistant surgeon must be not only a competent assistant, but also a capable operator, one who can be placed on his own responsibility with the view of assuming the duties of surgeon of a squad; in other words, he is a surgeon in reserve.

It has been customary to send surgeons here and there to render assistance, but it is quite evident that without the surgeon his aids are useless, and, on the other hand, the output of an operator who is obliged to work with strangers, men who are not familiar with his methods, is greatly diminished. Hereafter, the surgeon and his entire squad will be sent as a reinforcement. These squads will always be mobilized in the sense that immediately on receipt of a request for their assistance they will be conveyed either by railroad or by automobile, by the shortest possible route, and as quickly as possible, to the place from which the call came. After its work has been done, the squad rejoins the sanitary formation of which it is ordinarily a part. In its own territory the function of the squad varies according to the degree of activity. Sometimes this activity is intense because the nearest hospitals may be filled by recently wounded, thus necessitating such extra assistance as the squad may render. The regional director of the health service may detach the surgical squad from its place, and transport it at once to a place which is at that time swamped with work. This squad proceeds from place to place serving as a surgical reinforcement wherever it is needed. If the services of the squad are not in demand in its own immediate territory, the director of the region advises the undersecretary of state to that effect so that the disengaged squad is available for service in some other region or district. When the squad is again at liberty it returns to its original station awaiting further call. At the same time that the surgical squads are so retired, their services may be utilized: (1) by being assigned to the service of one or more hospitals with but one surgeon on the station; (2) by combining the services of two or more hospitals into one, or (3) by closing the entire hospital temporarily. At the same time that these surgical squads are called on for reinforcements, their surgical services, in a state of great activity, are extended by the application of measures opposite to the preceding ones. Such an elastic organization of the surgical service will have for effect the possible mobilization of the surgical squads: (1) within the limits of one region (on the initiative of the director of the region), or (2) from one region to another (on the order of the undersecretary of state).

TREATMENT OF WAR WOUNDS BY MAGNESIUM CHLORID

In the course of the military operations on the Somme, Dr. Guillaume-Louis personally took care of more than 1,200 severely wounded in the surgical automobile ambulances. He communicated the results of his study to the Society of Surgery of Paris. On the arrival of the wounded he always employed the same treatment, which was as follows: Removal of all foreign bodies and necrotic tissue; disinfection with ether. After the first time he made use of various therapeutic measures, but experience led to his preferring magnesium chlorid. He did not use any drains. Instead, he places in the wound a wick which soaks up the solution. On the surface he applies a compress saturated with the same solution. The dressing is renewed every day with the greatest possible aseptic precautions. Rapidly, under the influence of magnesium chlorid, the wound is cleansed, the pathogenic agents are diminished in number, and the secretions are dried up. In the course of a few days the wound is disinfected sufficiently so that it can be sutured for secondary union. Guillaume-Louis has employed other methods of dressing with good results, such as Labarraque's solution, oxygenated waters, neutral solution of chlorinated soda (Dakin's solution) and magnesium hypochlorite, but he has not obtained the same satisfactory results from any of these as from the use of magnesium chlorid. Delbet believed that he had demonstrated several times that neutral solution of chlorinated soda is not as harmless as it is said to be; that while it may not alter the tissues themselves it does alter the leukocytes and transforms the albumin of the exudate so as to make it a good culture medium for bacteria.

THE TAX ON SACCHARIN

The government proposes to limit the use of saccharin to certain pharmaceutical products temporarily employed in the manufacture of foods. The minister of finance has estimated that under these conditions the consumer of saccharin was not to be exempted from the payment of the tax which he has paid heretofore on sugar. As saccharin possesses a sweetening power from 400 to 500 times greater than that of cane sugar, the minister of finance fears that under these circumstances concentrations of saccharin may be used in spite of the regulations within which such use is to be confined or limited. Therefore it is proposed to place a tax on saccharin corresponding to that placed on sugar, which was placed at 200 francs ($40) per kilogram.

THE STUDENTS OF THE VAL-DE-GRÂCE

A decree has been issued recognizing the public utility of the friendly society of the students and former students of the school for the application of military medicine and pharmacy of Val-de-Grâce. Henceforth, that society, which numbers 800 members, will be permitted to receive donations and bequests. The society will aid the widows and orphans of those of its members who have succumbed in the course of the war (580 members have died since the beginning of hostilities). The treasurer is Médecin-Major Fasquelle, rue Ballu, No. 8, Paris.

Association News

THE NEW YORK SESSION

Time for Reservations in Scientific Exhibit Extended

In order that all members of the Association having interesting material for the Scientific Exhibit may have an opportunity to present it, the time for closing reservations for space for the Scientific Exhibit for the New York session has been extended to May 1. Space has been assigned to all those from whom applications have been received. As there is only a small amount of space left, all those desiring to make an exhibit should make application at once. The Belvedere or Summer Garden on the top floor of the Hotel Astor has been reserved for the Scientific Exhibit. This beautiful hall has been divided into spaces averaging 12 by 6 feet. Wall space is also available for displaying charts, tables and photographs. All the remaining space will be assigned, May 1. For application blanks and further information address the Director of Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

First Announcement of Special Train

For the accommodation of those going to the annual session of the American Medical Association in New York, June 4-8, 1917, the Michigan Central Railroad will operate an "American Medical Special" leaving Chicago from the Central Station, Twelfth Street and Michigan Avenue, at 5:40 p. m., Saturday, June 2.

This will be an all Pullman train, consisting of club car, standard and compartment sleepers, observation car and dining cars. The train will make intermediate stops on the Michigan Central at Kalamazoo, Battle Creek, Jackson and Detroit, and is scheduled to arrive in Niagara Falls at 6:10 a. m., June 3, where cars may be occupied until 8 a. m. The entire day may be spent visiting the various points of interest at Niagara Falls. Arrangements will be made with one of the principal hotels to serve breakfast, luncheon and dinner. The special train will leave Niagara Falls at 7:20 p. m., June 3, to arrive in New York at 7:50 a. m., June 4.

If some of the party wish to make the trip down the Hudson River from Albany to New York via the Hudson River Day Line boat, sleepers will be attached to the special at Niagara Falls and dropped at Albany on arrival of the train at that point early Monday morning, June 4. Those in this party can leave Albany via boat at 8:30 a. m., arriving in New York at 5:30 p. m.

The advantages of these special arrangements are many. They permit leaving Chicago at the close of the business day on Saturday, spending an entire day at Niagara Falls, and arriving at New York Monday morning in ample time for the meeting, without payment of excess fare. Those desiring to use the special from Chicago going through to New York direct without stopover at Niagara Falls can do so, arriving New York 5:35 p. m., June 3, by paying an excess of $5. For more detailed information consult any agent of the Michigan Central or write directly to Mr. Fred. E. Deal, C. P. A., 228 S. Clark Street, Chicago.

Marriages

HUGH TODD RYAN, M.D., Schuylkill Haven, Pa., to Miss Mary E. Standiford of Uniontown, at Philadelphia, March 28.

GRACE OTTOLEE DOANE, M.D., Des Moines, Iowa, to Mr. Leo L. Crowl of Des Moines, at Osceola, Iowa, April 8, 1916.

CLYDE FERDINAND LOY, M.D., Shawnee, Okla., to Miss Katherine Ormsby of Louisville, March 26.

DAVID NATHANIEL KREMER, M.D., to Miss Minnie K. Gabouvitz, both of Philadelphia, March 25.

WILLIAM PARK MILLS, M.D., to Mrs. Alice W. MacLeod, both of Missoula, Mont., March 25.

ROBERT SONNENSCHEIN, M.D., to Miss Flora Kieferstein, both of Chicago, April 5.

Deaths

Augustus White Stinchfield, M.D., Rochester, Minn.; Medical School of Maine, Brunswick, 1868; aged 74; formerly a Fellow of the American Medical Association; one of the founders of the Olmsted County Medical Society; a veteran of the Civil War; president of the First State Bank of Rochester and also of the Eyota and Dover State banks and Rochester Loan and Trust Company; died at his home, March 15, from cerebral hemorrhage.

Walter Bayne Geikie, M.D., Toronto, Ont.; Medical Board of Upper Canada, 1851; Jefferson Medical College, 1852; University of the Victoria College, Coburg, Ont., 1859; L.R.C.P. (Lond.), 1867; L.R.C.S. (Edin.), F.R.C.S. (Edin.), 1867; aged 86; dean of the Trinity Medical College, Toronto, for twenty-five years; a member of the Ontario Medical Council; died at his home, January 12, from senile debility.

Frank Carothers Wilson, M.D., Louisville, Ky.; University of Virginia, Charlottesville, 1867; aged 75; formerly a member of the Kentucky State Medical Association, and professor of chest diseases, physical diagnosis in the University of Louisville, Ky., and lecturer on hygiene and dietetics; a Confederate veteran; died at the home of his sister in Dunedin, Fla., March 22, from arteriosclerosis.

John S. Van Voorhis, M.D., Belle Vernon, Pa.; Jefferson Medical College, 1847; aged 93; formerly a member of the Medical Society of the State of Pennsylvania; first secretary of the Washington County (Pa.) Medical Society; one of the organizers of the first railway in the Monongahela Valley; a member of the state legislature from Washington County in 1855; died at his home, March 15.

Evelyn Baldwin, M.D., Rochester, N. Y.; Women's Medical College of the New York Infirmary, New York, 1892; aged 56; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of New York; for many years a member of the staff of the Rochester General Hospital; died at her home, March 24, from pneumonia.

William van Eman Riddle, Burgettstown, Pa. (license, Washington County, Pa., 1881); aged 77; for fifty-three years a practioner; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania, and once president of the Washington County Medical Society; died at his home, March 25.

William Edward Vest, M.D., Des Moines, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1878; Jefferson Medical College, 1880; aged 61; a Fellow of the American Medical Association, and one of the leading surgeons of Des Moines; died in his apartment in Des Moines, March 22, from meningitis following an acute otitis media.

John Norton Pascoe, M.D., Denver; Northwestern University Medical School, Chicago, 1880; aged 65; formerly a Fellow of the American Medical Association; a member of the Colorado State Medical Society; for many years a practitioner and mining prospector of Silverton, Colo.; died in St. Joseph's Hospital, Denver, March 7.

Albert Morrall, M.D., Wamego, Kan.; Rush Medical College, 1867; aged 87; an officer in the Confederate Service during the Civil War; assistant surgeon for the Union Pacific System at Wamego, and from 1894 to 1898 postmaster; died in the University Hospital, Kansas City, Mo., March 4, after a surgical operation.

John Kline Seaman, M.D., Reading, Pa.; Bellevue Hospital Medical College, 1869; aged 72; formerly a Fellow of the American Medical Association; a member of the Medical Society of the State of Pennsylvania; for several years a member of the medical staff of St. Joseph's Hospital; died at his home, March 12.

Miles Nelson Newman, M.D., Ossian, Ind.; College of Physicians and Surgeons, Keokuk, Iowa, 1870; aged 73; formerly a Fellow of the American Medical Association; a veteran of the Civil War; for eight years trustee of Jefferson Township, Wells County, Ind.; died at his home, March 26, from heart disease.

Lewis Garibaldi Langstaff, M.D., Thorne Hill, Toronto, Ont.; Victoria University, Coburg, Ont., 1884; aged 57; formerly a Fellow of the American Medical Association, and adjunct physician to St. John's Hospital, Brooklyn; a veteran of the Spanish-American War; died at his home, March 16, from brain tumor.

Theodore Ilg, M.D., St. Louis; Marion-Sims Medical College, St. Louis, 1894; aged 40; formerly a member of the

Missouri State Medical Association; whose license was revoked five years ago on account of conviction for illegal practice; died, March 20, at the St. Louis City Hospital, from kidney disease.

Joseph Francis O'Shea, M.D., Lynn, Mass.; New York University, New York, 1886; aged 53; a member of the Massachusetts Medical Society; a member of the surgical staff of the Lynn Hospital; assistant medical examiner for Essex County; city physician of Lynn; died at his home, March 29.

Henry Mortimer Brush, M.D., New York; New York University, New York, 1862; aged 80; secretary of the Alumni Association of his alma mater from 1867 to 1870; surgeon of the Fourth New York Volunteer Field Artillery during the Civil War; died in Hahnemann Hospital, New York, March 28.

William G. Winder, M.D., Philadelphia; Jefferson Medical College, 1869; aged 69; a Fellow of the American Medical Association; formerly physician to the Convent of the Sacred Heart, Torresdale, Pa., and the Edwin Forrest Home, Holmesberg, Pa.; died at his home, March 26, from neuritis.

Anna S. Rosenbluth, M.D., Paterson, N. J.; Women's Medical College of the New York Infirmary, New York, 1894; identified with the Jewish hospital work in the United States; superintendent of the Zion Hospital, Brooklyn; died in that institution, March 30, from cholecystitis.

George Baker Underwood, M.D., Gardner, Mass.; Dartmouth Medical School, Hanover, N. H., 1882; aged 62; formerly a Fellow of the American Medical Association; a member of the Massachusetts Medical Society; died at his home, February 2, from tuberculosis.

Charles Frederick Denny, M.D., St. Paul; Harvard Medical School, 1882; aged 59; a Fellow of the American Medical Association; for many years a member of the staff of the St. Paul City and County Hospital; died in Los Angeles, March 24, from heart disease.

Oscar Newton Carter, M.D., Republic, Mo.; University of the South, Sewanee, Tenn., 1899; aged 42; formerly a Fellow of the American Medical Association; a member of the Missouri State Medical Association; died in his office, March 27, from cerebral hemorrhage.

Arthur Vinol Lyon, M.D., Brockton, Mass.; Harvard Medical School, 1887; aged 53; a member of the Massachusetts Medical Society; a member of the visiting staff of the Brockton State Hospital; died at his home, February 21, from cerebral hemorrhage.

Thomas Edward Cunningham, M.D., Cambridge, Mass.; Harvard Medical School, 1883; aged 66; a Fellow of the American Medical Association; a specialist on internal medicine; died at his home, February 27, from carcinoma of the right lung.

Wallie C. Lane, M.D., Mountain Grove, Mo.; University Medical College of Kansas City, Mo., 1898; aged 42; died in Springfield, Mo., March 13, from the effects of a gunshot wound, self-inflicted, with suicidal intent, while mentally deranged.

Richard Hastings Dillon, M.D., Manchester, N. H.; College of Physicians and Surgeons, Chicago, 1897; aged 48; formerly a member of the New Hampshire Medical Society; at one time a medical officer in the state militia; died at his home, recently.

J. D. McNeiley, M.D., Sewal, Iowa; College of Physicians and Surgeons, Keokuk, Iowa, 1886; aged 65; while returning from a professional call, March 9, sustained a fracture of the spine by the overturning of his automobile, and died six hours later.

William A. Hunt, M.D., Evansville, Ind.; Missouri Medical College, St. Louis, 1891; aged 75; a member of the Indiana State Medical Association; a practitioner for forty-five years; died at his home, February 23, from bronchial pneumonia.

George Francis Adye, M.D., Newtonville, Ind.; Cincinnati College of Medicine, 1865; Eclectic Medical Institute, Cincinnati, 1870; aged 79; a member of the Indiana State Medical Association; died at his home, February 7.

Columbus A. Cox, M.D., Stanford, Ky.; University of Louisville, Ky., 1860; aged 81; surgeon of U. S. Volunteers during the Civil War; died at the home of his son in Jonesboro, Tenn., Februrary 2, from senile debility.

Arthur von Werder, Chicago (license, Illinois, 1889, on certificate from War Department, Russia, 1883); aged 75; a practitioner since 1859; died at his home, March 23, from cerebral hemorrhage.

Isaac Crowther, M.D., Chester, Pa.; Hahnemann Medical College, Philadelphia, 1880; aged 59; a member of the medical staff of the J. Louis Crozier Hospital, Chester; died at his home, March 21, from heart disease.

George Clark Blaisdell, M.D., Contoocook, N. H.; Harvard Medical School, 1867; aged 72; a Fellow of the American Medical Association; local surgeon for the Boston and Maine System; died at his home, March 5.

J. Albert Mattson, M.D., Chisago City, Minn.; University of Minnesota, Minneapolis, 1904; aged 42; a member of the Minnesota State Medical Association; died suddenly, March 18, from postpharyngeal abscess.

Philip G. Foust, M.D., Somerset, Ind.; Medical College of Indiana, Indianapolis, 1895; aged 44; formerly a Fellow of the American Medical Association; died at his home, February 21, from pneumonia.

H. W. Heasley, M.D., Grand Rapids, Mich.; Detroit College of Medicine and Surgery, 1893; aged 54; a member of the Michigan State Medical Society; died at Harper Hospital, Detroit, March 14.

Justus Crosby French, M.D., Webster, S. D.; Harvard Medical School, 1875; who retired from practice about twenty-five years ago; died in a hospital in San Diego, Calif., March 6, from pneumonia.

Charles S. Macy, M.D., New York; New York Homeopathic Medical College, New York, 1881; aged 67; for many years instructor in obstetrics at the Flower Hospital; died at his home, March 15.

William C. Campbell, M.D., Creighton, Neb.; College of Physicians and Surgeons, Keokuk, Iowa, 1881; a member of the Nebraska State Medical Association; died in Omaha, February 6.

David Kline Bond, M.D., Waterloo, Iowa; State University of Iowa, College of Homeopathic Medicine, Iowa City, 1904; aged 51; died at his home, March 14, from uremia.

J. C. Iserman, Topeka, Kan. (license, Kansas, 1901); aged 79; for more than half a century a practitioner of Kansas; at one time postmaster; died recently in Florida.

A. C. Brabsan, Otto, N. C. (license, North Carolina); aged 77; for more than fifty years a practitioner of Rabun County, N. C.; died at his home near Otto, March 7.

Walter Estus Deuel, M.D., Chittenango, N. Y.; New York Homeopathic Medical College, New York, 1876; aged 64; died at his home, March 5, from pneumonia.

Francis James Hogan, M.D., St. John, N. B.; Harvard Medical School, 1908; aged 34; formerly of Bridgeport, Conn.; died at his home, March 8, from pneumonia.

William H. Hornor, M.D., Duck Creek, W. Va.; Eclectic Medical College, Cincinnati, 1865; aged 76; died at his home, February 11, from bronchial pneumonia.

Jasper P. Norcross, Miller, Neb. (license, Nebraska, 1902); aged 66; a practitioner and druggist of Buffalo County, Neb., since 1884; died at his home, March 19.

G. T. Hale, M.D., Junction City, Ark.; American Medical College, St. Louis, 1876; aged 82; died at the home of his daughter in Junction City, recently.

Samuel G. Miller, M.D., Livermore, Pa.; Western Reserve University, Cleveland, 1867; aged 88; died, March 15, at the home of his son in Blairsville, Pa.

Andrew Glass Gorrell, M.D., Ossian, Ind.; State University of Iowa, Iowa City, 1875; aged 76; a veteran of the Civil War; died at his home, March 20.

Amplias Alonzo Hurt, M.D., Hickory, Ky.; Hospital College of Medicine, Louisville, 1876; aged 66; died at his home, February 10, from pneumonia.

Joseph W. Baker, M.D., Louisa, Va.; Medical College of Virginia, Richmond, 1864; a Confederate veteran; died at his home, March 14.

Sidney J. Burch, M.D., Rhineland, Mo.; Washington University, St. Louis, 1877; aged 61; died at his home, March 4, from diabetes.

John Cameron, M.D., Wheelock, Texas; Tulane University, New Orleans, 1860; aged 91; died at his home, Ferbuary 19, from cystitis.

Andrew J. Carper, M.D., Elkhart, Ind.; Medical College of Fort Wayne, Ind., 1882; aged 71; died in his office, March 20.

Michael J. Donnelly, M.D., Summithill, Pa.; Rush Medical College, 1869; aged 78; died at his home, March 13.

Correspondence

Dr. C. A. L. Reed and the Etiology of Epilepsy

To the Editor:—I cannot but feel that the letter of Dr. Charles A. L. Reed (The Bacteriologic Phase of Chronic Convulsive Toxemia [Epilepsy] of Intestinal Origin, THE JOURNAL, Feb. 24, 1917, p. 652) deserved a more important place than it received. Although over a month has passed since its publication, it seems to have attracted the attention of comparatively few readers. This article, to my mind, is the most important that Dr. Reed has published, notwithstanding the fact that he has, as yet, failed to appreciate that heredity and gross brain lesions do occasionally play some part in the production of epilepsy.

He apparently has come to the point at which he appreciates that negative findings have a certain definite value, which view no one would have accused him of possessing when he closed his article published in THE JOURNAL, Oct. 14, 1916, by stating, "as such I, like other clinicians, must be guided by the technical findings of pathologists and bacteriologists, but they must be findings of something, not of nothing." To this statement I would say that there is no field of research work in which finding "things" is easier than it is in bacteriology. Surroundings and technic play quite as important a part in bacteriology as heredity and gross brain lesions do in epilepsy.

I fail to see where Dr. Reed has added one thing of importance to the literature on epilepsy. All that he has written has been generally accepted for years, and the surgical aspect of the treatment of the toxic cases was reviewed by Dr. Ernest LaPlace, professor of surgery at the Medico-Chirurgical College, Philadelphia, years ago. What he has done by his premature publications has been to fill the general practitioner, who depends on the research laboratories as a source of information, with doubt and misgiving.

D. A. THOM, M.D., Worcester, Mass.
Assistant Pathologist, Massachusetts Commission on Mental Diseases.

Pennsylvania and Entrance Conditions

To the Editor:—I am enclosing a resolution which I would ask that you publish in THE JOURNAL.

J. M. BALDY, M.D., Philadelphia.

WHEREAS, In 1914 certain "conditions" in the preliminary sciences were permitted by the Association of American Colleges, to terminate September, 1917, and

WHEREAS, Said Association of American Colleges during its meeting in Chicago, February, 1917, extended these "conditions" for a further period of time, therefore, be it

Resolved, That the Bureau of Medical Education and Licensure of the State of Pennsylvania hereby registers its protest against such action and announces that approval will be refused any candidate applying to enter Pennsylvania either through examination or through reciprocity with any condition of any kind after September, 1917. And it is further

Resolved, By the said bureau, that it will remove from the approved list of the State of Pennsylvania the name of any medical college allowing any conditions on the preliminary requirements after September, 1917.

[NOTE.—The foregoing communication was referred to the secretary of the Council on Medical Education of the American Medical Association, who says:

These preambles and resolutions need a word in correction. The rules in regard to conditions were prepared in 1915 by a joint committee representing the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges, after an extensive correspondence with leading medical educators. Those conditions were to be allowed, meanwhile, until Jan. 1, 1917, after which time they were to be either discontinued or continued, as might be determined at the next annual meetings of the two associations. By a further understanding the rules with certain modifications were extended to Jan. 1, 1918. Under the present arrangement the student is permitted to enter the medical school conditioned in four semester hours of *either* physics or biology but not in both. No condition is to be allowed in chemistry, and high school physics is no longer to be accepted in lieu of college physics. The committee representing the two organizations believe that the rapid but very desirable advances which are being made in preliminary education will work undue hardship on a large proportion of students unless such conditions were allowed. After a few years have been allowed for readjustments under the higher standards, it may then be found reasonable to insist that students enter the medical course without conditions. In the meantime, it is believed that to allow certain deserving students to carry a four semester hour condition will not handicap such students in their medical course.]

An Unmulish Trick!

To the Editor:—I wish to report an extremely rare and interesting observation: March 4, 1917, at the farm of Mr. T. B. Neely, Peoria, Ariz., I saw an iron gray mare mule, 4 years old, 15½ hands high, and weighing 1,100 pounds, suckling a male colt to which she had given birth two months previously. The owner, Mr. Neely, informed me that the mother was raised by him, and he knows her to be a true hybrid. She has this appearance to me, and in no way resembles a jennet. He further stated that, at the time conception evidently occurred, this mare mule was confined in a pasture with a large sorrel stallion, and the act of copulation between the two animals was repeatedly observed. As pregnancy, naturally, was unsuspected, the mare mule was worked at her usual task on the plow until immediately before the birth of the colt. The colt is of good size, vigorous and healthy, and eagerly suckles. Its feet, ears and head have the appearance of those of a mule, the ears and head, however, being unusually long. The shape of the body more nearly resembles that of a horse. Its color is sorrel or light bay. These facts can be authenticated by the owner.

RAY FERGUSON, M.D., Patagonia, Ariz.
Chairman, Committee on Public Health and Vital Statistics, Arizona State Senate.

The Clarification of Milk

To the Editor:—In THE JOURNAL, March 24, 1917, Prof. E. G. Hastings of the University of Wisconsin presents his views concerning the clarification of milk. They are distinctly hostile to this process, and leave the impression that the use of a clarifier not only encourages sloppy methods at the point of production, but that health officers favoring the process are deceiving the public. Cincinnati and five other cities are cited as examples of the lengths to which misguided enthusiasts will go in an endeavor to supply a community with milk that is not only safe but decent in appearance.

Cincinnati health officials have never suggested that clarification is a substitute for cleanliness at the point of production. They do believe that it is a very efficient adjunct to cleanliness. The material removed will do more to open the eyes of a careless dairyman to his shortcomings than many hours of eloquent appeal. Seeing is believing. The Cincinnati Department of Health has not passed a regulation requiring clarification.

Professor Hastings admits that, "under ordinary conditions, more or less dirt of an insoluble nature gets into the milk," and that strainers are used for the purpose of eliminating a portion of it at the point of production. He failed to include the soluble material that constantly gets into milk. Microscopic and macroscopic examination of milk sediment reveals the presence of an occasional blood clot, hairs, cow manure, pus cells, bacteria and other flotsam and jetsam of the dairy industry. These inclusions occur in the product of the best regulated dairies, in spite of the greatest precautions taken to exclude them.

The question naturally arises, If it is a good thing to eliminate a portion of the foreign material by straining at the point of production (a process which he does not condemn),

why is a method that removes all of it open to condemnation? Clarification will not neutralize the danger of infection that may reside in unpasteurized milk. It is immeasurably superior to the ordinary methods of straining employed on dairy farms. If efficiency in performing this function is to be the measure of condemnation, and if the degree of condemnation is to be proportionate to the degree of efficiency, then the advocates of clarification should be sentenced to service in a diet squad created for the purpose of solving the high cost of living. Clarification (perfect straining) removes all visible sediment. If this is bad practice, why is partial removal by imperfect straining good practice?

Reasoning backward, all methods of straining should be discontinued, for the more perfect they are, the more reprehensible they become. The covered milk pail should be abolished because it excludes dirt that would be included "under ordinary conditions," and cleansing the cow becomes one of those finicky ideas which, if carried out, prevents the consumer from knowing just how dirty a sample of milk may be "under ordinary conditions." People naturally object to having milk served to them wearing a flowing beard or a toupee or sadly in need of a haircut, and clarification confiscates all of the hirsute appendages found in milk produced "under ordinary conditions." We might go a step farther and include the cow manure that gave milk its body, bouquet and delectable flavor in the good old days before dairy inspectors got busy.

Experience has taught me that the happiness of the consumer is not increased when he finds the foreign material that escapes the strainer at the point of production. Following the lead suggested by Professor Hastings, practically every bottle of milk would show visible sediment, little if any of it having any direct effect on health, but a positive effect on appetite, and, therefore, indirectly on health.

Furnishing a safe milk does not, in my humble judgment, end the responsibility of a public health official. It must also make a decent appearance and an appeal to appetite. To fill these requirements, it must be produced in clean dairies by clean milkers, cooled quickly, shipped in sterile containers, pasteurized, *clarified* and delivered to the consumer in sealed packages.

J. H. Landis, M.D., Health Officer, Cincinnati.

[Dr. Landis' letter was referred to Professor Hastings, who replies:]

To the Editor:—The rules and regulations which are passed by the health departments of our various governmental units, whether they be municipal, state or federal, should have some actual relation to health problems; whenever a health department is instrumental in the passage of regulations that have no relation to public health it is in truth deceiving the public. It seems to me perfectly true that any city which passes an ordinance requiring the clarification of milk or any health department which passes such a rule is leading the public astray. I should not say that the clarification of milk encourages sloppy methods, but I do think that it may permit the use of methods which could not otherwise be used.

The statement made in the article concerning the cities that have passed ordinances requiring clarification was based on what I supposed to be reliable information. I certainly regret having included Cincinnati in this list since this city has made no such requirement.

I think an inference has been drawn from the article that is not wholly justifiable, namely, that it is a good thing to eliminate a portion of the foreign matter by straining at the point of production. I did not condemn this process because, as it seems to me, it is such an ingrained custom of the American farmer that it will be many years before we can hope to prevent him from straining the milk. I do, however, believe that if this process could be eliminated it would have an immense value in inducing cleanliness. A beginning is being made in this work. The inspectors of the New York City Board of Health have found in their work at the various milk receiving stations that the dirt test becomes of little value to them as soon as the farmer applies efficient methods of straining the milk. The officials have apparently begun to consider whether it would not be a wise thing to prohibit the straining of milk on the farm. For many years this has been a custom in certain of the milk-producing districts of Switzerland, not only for milk that is to be used as market milk, but also for milk to be used in the manufacture of cheese. This custom has been brought to this country by some of the Swiss cheese makers. They realize that they can tell far more concerning the methods which the farmer is using in the production of the milk if he does not strain the milk than if he does. I desire to correct the impression which I apparently have made: that I believe that partial removal by imperfect straining of milk is a good practice. I do not think, however, that any city needs to pass an ordinance requiring that the farmers shall strain the milk.

In one other paragraph of Dr. Landis' letter he seems to have confused prevention of the introduction of dirt into milk with its removal. It is well known that the bacteria which are introduced with the mud and manure that get into milk are largely washed from the solid materials with which they were in contact. When these microscopic objects are strained from the milk the bacteria are not likewise removed but remain in the milk. The bacteria are certainly the agents that are instrumental in causing the spoiling of milk, and in many cases influence its healthfulness. The removal of the carrying agent but not the bacteria cannot improve the healthfulness of the milk. I suppose if an agar culture of the typhoid organism were introduced into a vat of milk and allowed to remain until all of the organisms had been washed off and then if the agar on which the bacteria were carried was removed from the milk, we should have something quite comparable to what we actually have in the straining of milk. This certainly would be very different from preventing the introduction of the culture into the milk. The covered milk pail prevents the introduction of dirt with its adherent bacteria. The cleaning of the animal and every other process that prevents the introduction of foreign matter into the milk are certainly to be recommended, but the removal of what we may call the inert agent and leaving the active agent behind can be of little value to the milk consumer other than from purely esthetic grounds.

The largest milk company in the state of Wisconsin has been and still is, I believe, using a very simple straining device. This device costs the company but little to make and nothing for its operation. It apparently does for this company what very much more expensive processes are doing for other companies, and it enables that company to handle milk at a lower margin than would otherwise be the case. It certainly shows that clarification of milk is not an essential factor in the happiness of the consumer.

E. G. Hastings, Madison, Wis.

Why I Do Not Favor Compulsory Health Insurance

To the Editor:—I do not favor compulsory health insurance:

1. Because it would destroy the personal relations that have always existed between physician and patient.

2. Because it would reduce the rank and file of a learned and respected profession to the level of wage earners.

3. Because it is nothing more or less than lodge or contract practice on a universal scale, and this has proved by experience to be an unmitigated evil; unsatisfactory from the standpoint of both physician and patient.

4. Because, specious arguments of its advocates notwithstanding, compulsory health insurance has *not* been the means of lowering the mortality rate of any country in the world, for it has been reduced as greatly in those countries that have no state or industrial insurance system as it has been in those that have compulsory health insurance.

5. Because it is pure socialism, and if such medical service is enforced by laws there is no reason why we should not have compulsory insurance for feeding, clothing, sheltering and providing employment for the same classes, as their health depends as much on proper feeding, clothing, shelter and employment as it does on proper medical attention.

6. Because the problems that have given rise to the agitation for compulsory health insurance are not medical problems at

all, but purely economic ones, and with a living wage paid by employers to the workers they will be satisfied, and in a position to pay their own bills, medical and otherwise, without aid from the state or any other source.

7. Because it is complicated, adjusted to the peculiarities of European conditions, and would be practically impossible to harmonize with American institutions and ideals.

8. Because the rank and file of the medical profession, reduced from an independent position to the condition of employees working for a corporation, would be as underpaid and dissatisfied as are other wage earners, and this state of affairs would not conduce to the advancement of medicine or redound to the benefit of those under their care.

9. Because the healthy rivalry now existing among physicians to give increasingly efficient service to their patients in order to gain and to hold practice would cease, as no physician would gain anything by increasing his efficiency.

10. Because the meetings of medical societies now devoted to the discussion of scientific subjects would become sessions of debate concerning matters pertaining to the workings of compulsory health insurance to the exclusion of those scientific subjects, the undisturbed consideration of which is necessary for our advancement and learning.

11. Because neither capital, organized labor, the state nor the medical profession desire to have a revolutionary upheaval at the present time, or in fact at any time.

12. Because it would enslave, burden and belittle all parties to it, especially the wage earner, and the physician, would completely commercialize the latter, and ring the death knell of medicine as a humanitarian calling.

13. Because it would be a nightmare with no awakening.

14. Because, from the standpoint of sentiment in the United States of America, it is a fad of the hour, akin to universal twilight sleep, the setting of the clock an hour ahead, and other sick minded efforts to change the things that are.

15. Because nobody really wants it, it being a self-evident fact that, like everything else, cheapening medical service means lowering its quality, and no person in this country need suffer from lack of medical attention and care, as those too poor or too improvident to pay are at all times accommodated in hospitals or other institutions; and because compulsory health insurance does not in Europe, and cannot here, either prevent disease or accident or drive a lazy, malingering or chronically sick individual to work.

RALPH S. CONE, M.D., Westwood, N. J.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

INSTRUCTION IN FIRST AID

To the Editor.—If you have a manual suitable for the use of a first aid class, kindly send me a copy on approval.

CHARLOTTE B. GARDNER, M.D., Cumberland, Md.

To the Editor.—Have you any articles or booklets which would be suitable to use in instructing, through lectures and demonstrations, a large class of women in first aid? If you do not publish any, will you refer me to some that are approved for such use by the American Medical Association?

EVA M. LOCKE, M.D., Nashua, N. H.

ANSWER.—The American National Red Cross publishes a woman's edition First Aid book, price, 30 cents, which can be secured from most booksellers, and which is used as a textbook in connection with courses in First Aid to the Injured by the American Red Cross. When instructing men it is requested that particular attention be given litter bearer work and other transportation methods in order that they may, after taking the First Aid course, be partially prepared for service in any Red Cross organizations that may be formed for the purpose of assisting the armed forces of the United States in time of war.

The First Aid course for women is intended only to teach them what they can do when accidents and sudden illnesses occur within their own homes or elsewhere, and is not, except that they have added to their general information, expected to qualify or accepted as qualifying them for service with the Red Cross in time of war. Women who desire to prepare themselves for war service should write to the "Division of Instruction for Women" of the American Red Cross, Washington, D. C., which offers courses in "Elementary Hygiene and Home Care of the Sick," "Dietetics" and "Preparation of Surgical Dressings."

While it is recommended that women take instruction in First Aid with the belief that it will be a valuable asset to them in their everyday lives, the American Red Cross states that such instruction does not fit them for service in time of war because the Red Cross is not, except in great emergency, allowed to operate in the zone of the advance (front).

The following has been suggested as a series of lectures on First Aid:

1. Shock, use of bandages, triangular bandage, four tail bandage, etc.
2. Fractures.
3. Fractures and review of previous work.
4. Wounds.
5. Bleeding and review of previous work.
6. Insensibility and poisoning.
7. Drowning, choking, etc.; artificial respiration.
8. Review.
9. Removal of patient; home preparations.
10. Review.
11. Examination.

One and one half hours is devoted to each subject. A lecture is given which is usually followed by practical demonstrations in which one member of the class uses another as a patient. The practical work is thus linked with the theoretical.

VENEREAL PROPHYLAXIS UNIT

To the Editor:—Where can I find a description for the preparation of a venereal prophylaxis as is used in the Army?

H. H. FARKAS, M.D., York, Pa.

ANSWER.—According to the manual for the Medical Department of the Army, 1916, the venereal prophylaxis unit contains the following articles:

3 enamel-ware basins
200 sheets form 77, medical department
1 glass graduate, 120 c.c.
350 tablets hydrargyri chloridum corrosivum; 1 tablet in 500 c.c. of water makes a 1:1,000 solution
200 ampules of protargol, 2 gm. in an ampule.
2 cakes Ivory soap
4 boxes gauze sponges, 1 dozen in a box
4 penis syringes
12 hand towels
4 bottles unguentum hydrargyri chloridi mitis, 30 per cent., ½ pound in each bottle.

This is packed in a pine box with a hinged lid. The weight of the outfit is 45 pounds. A list of contents and directions for administering the prophylactic treatment are pasted on the inside of the cover.

One outfit of this character is supplied to each evacuation hospital, base hospital or medical reserve unit. A medical reserve unit is a collection of medical supplies which it is estimated will meet the immediate requirements of a reserve for one infantry division.

VALUE OF "STERLING VIOLET RAY GENERATOR" IN THERAPEUTICS

To the Editor:—I am curious to learn the value of the violet ray in the treatment of disease. The violet ray seems to be much in evidence in Canada at the present time in various towns. It is well advertised, not in the same way as a "patent medicine" would be, but as a genuine form of treatment. The enclosed booklet gives a brief outline of what the agents for the "Sterling Violet Ray Generator" claim it will do. The reason I am troubling you about this matter is that I feel if there is anything in it as is claimed, it should be better known. It also seems that if this treatment is not capable of doing what is claimed for it, it is a rather serious thing for a person who may defer calling a physician.

J. A. G.

ANSWER.—The "Sterling Violet Ray Generator" is a small high frequency apparatus with some vacuum and possibly other electrodes. There is a violet color in these vacuum electrodes when they are energized. The apparatus is not one for producing violet or ultraviolet rays in the scientific meaning of those words. The apparatus certainly will not do the things claimed for it in the booklet which include the treatment of practically every ailment known to mankind.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARKANSAS: Little Rock, May 8-9. Sec., Dr. T. J. Stout, Brinkley, Ark.

ARKANSAS, ECLECTIC: Little Rock, May 8. Sec., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith.

ARKANSAS, HOMEOPATHIC: Little Rock, May 8. Sec., Dr. Scott C. Runnels, Little Rock.

HAWAII: Honolulu, May 7-10. Chairman, Dr. R. W. Benz, 1141 Alakea St.

ILLINOIS: Chicago, May 3-5. Sec., Dr. C. St. Clair Drake, Springfield.

MASSACHUSETTS: Boston, May 8-10. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

NEVADA: Carson City, May 7. Sec., Dr. S. L. Lee, Carson City.

NEW YORK: Albany, Buffalo, New York, and Syracuse, May 22-25. Sec., W. J. Denno, Education Bldg., Albany.

Ohio Reciprocity Report

Dr. George H. Matson, secretary of the Ohio State Medical Board, reports that 36 candidates were licensed through reciprocity from Aug. 9 to Dec. 6, 1916:

College	LICENSED THROUGH RECIPROCITY	Year Grad.	Reciprocity with
Howard University	(1912) West Virginia;	(1915)	Dist. Colum.
Northwestern University Woman's Medical School		(1902)	Illinois
Rush Medical College	(1900)	(1915)	Illinois
Indiana Medical College		(1907)	Indiana
Indiana University		(1910)	Indiana
Medical School of Maine		(1909)	Maine
Baltimore Medical College	(1902) West Virginia;	(1909)	Maryland
College of Physicians and Surgeons, Baltimore		(1914)	Maryland
Johns Hopkins University	(1912)	(1915)	Maryland
Tufts College Medical School		(1912)	Maine
Detroit College of Medicine and Surgery	(1916,2)		Michigan
University of Michigan Homeo. Med. School	(1898)		Michigan
Univ. of Mich. Med. School	(1909) (1912) (1915,2)	(1916)	Michigan
University of Minnesota		(1915)	Minnesota
St. Louis University	(1915, 2)		Missouri
Bellevue Hospital Medical College	(1898)		New York
Long Island College Hospital		(1915)	New York
University of Buffalo		(1904)	New York
Jefferson Medical College of Philadelphia		(1913)	New York
		(1915,2)	Penna.
University of Pennsylvania	(1902) Iowa;	(1915)	Penna.
Woman's Medical College of Pennsylvania		(1902)	Penna.
Vanderbilt University		(1912)	Texas
University of Berlin		(1903)	Illinois

Oregon January Report

Dr. Herbert S. Nichols, secretary of the Oregon State Board of Medical Examiners, reports the written examination held at Portland, Jan. 2-4, 1917. The total number of subjects examined in was 15; total number of questions asked, 104; percentage required to pass, 75. The total number of candidates examined was 30, of whom 24 passed, including 4 osteopaths, and 6 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent.
College of Physicians and Surgeons, San Francisco		(1916)	76, 81
Hahnemann Med. College of the Pacific		(1916)	75
Coll. of Phys. and Surgs., Chicago	(1902) 75;	(1903)	79
Rush Medical College		(1915)	79
University of Illinois		(1914)	83
University of Michigan Medical School		(1916)	78
University of Minnesota		(1910)	77
Missouri Medical College		(1897)	78
St. Louis College of Physicians and Surgeons		(1915)	78
Ohio Medical University		(1897)	75
University of Oklahoma		(1911)	75
University of Oregon	(1908) 75; (1916) 75, 75, 76,	78,	79.
Jefferson Medical College of Philadelphia		(1916)	87
	FAILED		
University of Illinois		(1914)	74
University of Louisville		(1907)	62
Maryland Medical College		(1905)	69
Cincinnati College of Medicine and Surgery		(1900)	73
Jefferson Medical College of Philadelphia		(1915)	77
Tennessee Medical College		(1901)	64

Rhode Island January Report

Dr. Gardner T. Swarts, secretary of the Rhode Island State Board of Health, reports that, Jan. 11, 1917, a graduate of the Homeopathic Medical College of Pennsylvania, 1882, was granted a license after an oral examination, the grade obtained being 80 per cent.

Medicolegal

Requirement of Vaccination in School District Justified by Conditions in County

(Hill et al. vs. Bickers et al. (Ky.), 188 S. W. R. 756)

The Court of Appeals of Kentucky dissolved an injunction granted by the circuit court in this suit by Hill, the principal teacher in the Bethlehem graded common school, the five district trustees, and ten patrons of the school, as plaintiffs, against the Henry County board of health and the county health officer, to prevent the defendants enforcing an order of the county board of health which required the teachers and pupils in the common schools of the county to be vaccinated as a condition to their further attendance. The court of appeals says that the state board of health had, by virtue of Section 2049 of the Kentucky statutes, giving it general supervision of the health of the citizens of the state, with power to make and enforce rules and regulations to prevent the introduction or spread of infectious or contagious diseases to or within the state, promulgated Rule 35 that "No person shall become a member of any school within the jurisdiction of this board, as teacher or scholar, without furnishing a certificate from some reputable physician that he or she has been successfully vaccinated, and has been revaccinated at least once in each seven years." Aug. 31, 1916, the Henry County board of health took steps to enforce this rule on and after Sept. 11, 1916, by notifying the teachers and trustees of the county schools to obey the rule. Hill conceived the idea that he had no right or authority as teacher to reject any pupil who offered to attend, and, backed by the chairman of the district board of trustees, who took the ground that the local board of health had no authority to enter or enforce the order of August 31, Hill declined to prohibit the attendance of unvaccinated pupils. Thereupon the local health board caused warrants to be issued against Hill and the chairman for disobedience of said order, and it was alleged that the defendants were threatening to have other and repeated similar warrants to issue against the plaintiffs. Affidavits showed that the residents of Bethlehem district, almost without exception, were violently opposed to the enforced vaccination of their children, and regarded it as an unnecessary and unwarranted invasion of their rights. It was said that there had not been a case of smallpox in that district within the past eight years, and that there was no reasonable apprehension of an outbreak. But the court thinks that, in view of what was shown to be the experience in Henry County, it was idle for the residents of Bethlehem district to say there was no necessity of enforcing the vaccination rule in the schools, or that it was an unreasonable requirement of the health board. They would make their unprofessional opinions jeopardize the health and lives of all the citizens of the county. Matters of such grave importance are not to be decided according to the whims of laymen. It presents a medical question; and for that reason boards of health are usually composed of physicians, experts in that line. The proof made it plain that the action of the board of health was not only reasonable, but also necessary. If it had done less, it clearly would have failed in its duty. The general and uniform rule is that, when there is a reasonable apprehension of the outbreak of a communicable disease, such as smallpox, health boards have authority to take such action as was here directed, in order to stamp out the disease and prevent its spreading. Even without a specific delegation of power, local or administrative authorities having control of the schools or general care of the public health are justified, by the existence of an emergency, in making vaccination a condition for admission to the public schools. And the legislature may also, by express provision, in the exercise of its police power, require or empower a local or administrative authority to require vaccination of children as a condition of their being admitted to the public schools, although smallpox be not prevalent, or its outbreak be not apprehended. But the converse is equally true, that unless power is clearly conferred local bodies may not require vaccination in the absence of smallpox, or the apprehension of an immediate outbreak thereof.

Society Proceedings

COMING MEETINGS

AMERICAN MEDICAL ASSOCIATION, NEW YORK, JUNE 4-8.

American Academy of Medicine, New York, June 4-5.
American Association of Anesthetists, New York, June 2.
Am. Assn. of Genito-Urinary Surgeons, Rochester, Minn., May 21-23.
Am. Climatological and Clin. Association, Lakewood, N. J., May 29-31.
American Dermatological Association, Cincinnati, May 24-26.
American Gastro-Enterological Assn., Atlantic City, April 30-May 1.
American Gynecological Society, Pittsburgh, May 31-June 2.
American Laryngological Association, Atlantic City, May 28-30.
Am. Laryn., Rhin. and Otol. Society, Niagara Falls, Can., June 1-2.
Am. Medico-Psychological Association, New York, May 29-June 1.
American Neurological Association, Boston, May 21-23.
Am. Ophthalmological Society, Virginia Hot Springs, May 29-30.
American Orthopedic Association, Pittsburgh, May 31-June 1.
American Otological Society, Atlantic City, May 29-30.
American Pediatric Society, White Sulphur Springs, May 28-30.
American Proctologic Society, New York, June 4-5.
American Psychopathological Association, Boston, May 24.
American Society of Tropical Medicine, New York, June 4-5.
American Surgical Association, Boston, May 31-June 2.
American Therapeutic Society, New York, June 1-2.
Arkansas Medical Society, Little Rock, May 1-3.
Association of American Physicians, Atlantic City, May 2-3.
Conference of State & Prov. Bds. of N. Amer., Washington, May 30-31.
Connecticut State Medical Society, New Haven, May 23-24.
Florida Medical Association, Atlantic Beach, May 18-19.
Georgia Medical Association, Augusta, April 18-20.
Illinois State Medical Society, Bloomington, May 8-10.
Iowa State Medical Society, Des Moines, May 9-11.
Kansas Medical Society, Salina, May 2-4.
Maryland Medical and Chirurgical Faculty, Baltimore, April 24-26.
Mississippi State Medical Association, Jackson, May 8-9.
Missouri State Medical Association, Springfield, May 14-16.
Nat. Assn. for Study and Prev. of Tuberculosis, Cincinnati, May 9-11.
National Assn. for the Study of Epilepsy, Skillman, N. J., May 28-29.
Nebraska State Medical Association, Lincoln, May 8-10.
New Hampshire Medical Society, Concord, May 16.
New York State Medical Society, Utica, April 24-26.
North Dakota State Medical Association, New Rockford, May 9-10.
Ohio State Medical Association, Springfield, May 14-16.
Oklahoma State Medical Assn., Lawton-Medicine Park, May 8-10.
South Dakota State Medical Association, Yankton, May 28-30.
Texas State Medical Association, Dallas, May 8-10.
Wyoming State Medical Society, Casper, May 9.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Anatomy, Philadelphia

March, XXI, No. 2

1 Laws of Bone Architecture. J. C. Koch, Baltimore.—p. 177.
2 Development of Scala Tympani, Scala Vestibuli and Perioticular Cistern in Human Embryo. G. L. Streeter, Baltimore.—p. 299.
3 *Effects of Inanition and Refeeding on Growth and Structure of Hypophysis in Albino Rat. C. M. Jackson, Minneapolis.—p. 321.

3. **Growth and Structure of Hypophysis in Rat.**—This paper forms the fourth of a series of studies made by Jackson on the effects of inanition on the albino rat. The material used included the hypophyses from ninety-one rats, 44 normal (control) rats of both sexes, varying from newborn to about 1 year of age; 15 rats held at maintenance (constant body weight) by underfeeding beginning at the age of 3 weeks; 6 older rats subjected to acute inanition and 5 to chronic inanition; and 21 young rats refed for various periods after being held at maintenance from the age of 3 weeks to 10 weeks or more. During normal postnatal growth there is considerable individual variation in the relative volumes of the three parts (lobes) of the hypophysis; but in general in the older rats the pars anterior (distalis) becomes relatively larger, and the pars nervosa correspondingly smaller, the pars intermedia remaining about the same in relative (percentage) volume. The relatively larger hypophysis of the female rats is due chiefly (if not entirely) to a larger anterior lobe. During the inanition, the volume changes in the lobe are variable. In young rats held at maintenance (constant body weight), the pars anterior is somewhat reduced, the intermedia and nervosa correspondingly larger. In chronic (adult) inanition the partes anterior and intermedia appear reduced, the nervosa increased. In acute (adult) inanition, the pars anterior appear relatively increased, intermedia decreased, and nervosa unchanged in relative volume. In young animals held at maintenance, the volume of the vascular stroma usually increases to about 13 per cent., and in acute or chronic inanition of adults to about 17 per cent. The parenchyma is, of course, correspondingly reduced in relative volume. During inanition, the loss is usually greater in the cytoplasm, the nuclei thereby increasing to 26 to 28 per cent. of the cell volume in the young held at maintenance, and to 23 to 26 per cent. in adults with chronic or acute inanition. The changes described in the hypophysis during hibernation are probably inanition effects. The rapid growth, of the body following periods of inanition may be due to the embryonic condition to which the cells are reduced; but there is no evidence that such growth is due to any specific histologic changes in the hypophysis or other ductless glands.

American Journal of Roentgenology, New York

March, IV, No. 3

4 Lateral Roentgenography of Spine. P. M. Hickey, Detroit, Mich. —p. 101.
5 *Roentgen Appearances of Osteomyelitis. R. Hammond, Providence, R. I.—p. 107.
6 Broader Relationship Between Roentgenology and Various Theories of Systemic Disorder from Localized Sources. P. Brown, Boston. —p. 110.
7 *Roentgen Diagnosis of Metastatic Malignant Disease of Bone with Special Reference to Spinal Column. G. E. Pfahler, Philadelphia.—p. 114.
8 *Renal and Ureteral Stone Symptoms in Spondylitis. E. S. Blaine, Chicago.—p. 122.
9 Simple Method of Immobilization. P. M. Hickey, Detroit.—p. 131.

5 and 7. Abstracted in THE JOURNAL, Nov. 11, 1916, p. 1469.
8. Abstracted in THE JOURNAL, Nov. 11, 1916, p. 1470.

Annals of Otology, Rhinology and Laryngology, St. Louis

December, 1916, XXV, No. 4

10 Clinical Pathology of Tuberculous Laryngitis. J. Dworetzky, Otisville, N. Y.—p. 803.
11 Radical Mastoid Operation. T. J. Harris, New York.—p. 835.
12 Accidents in Bronchoscopy. H. H. Forbes, New York.—p. 845.
13 Factor in Prognosis of Acute Suppuration of Middle Ear. F. E. Franchere, Sioux City, Iowa.—p. 857.
14 Study of Physicomechanical Function of Faucial Tonsil. E. L. Kenyon and W. T. Kradwell, Chicago.—p. 862.
15 Involvement of Labyrinth by Way of Ductus Endolymphaticus. N. H. Pierce, Chicago.—p. 881.
16 Case of Syringomyelia with Marked Vestibular Symptoms. G. E. Shambaugh, Chicago.—p. 891.
17 Massage of Eustachian Tube. A. Lewy, Chicago.—p. 898.
18 Double Mastoid Operation; Report of Case and Exhibition of Roentgenographs of Mastoids. N. H. Goodenow, Everett, Wash. —p. 904.
19 Modified Radical Operation for Chronic Suppurative Otitis Media. H. B. Blackwell, New York.—p. 908.
20 Nondiabetic Acidosis, with Special Reference to Postoperative Acidosis in Children. I. Frank, Chicago.—p. 917.
21 Social and Economic Aspects of Deafness. A. J. Amateau, New York.—p. 930.
22 Sore Throat Clinically Considered. S. Johnston, Baltimore. —p. 942.
23 Extensive Keloid of Mastoid Wound Cicatrix. F. L. Ryerson, New York.—p. 947.
24 Case of Epithelioma of Posterior Pharyngeal Wall Cured by Electrocautery. D. Roy, Atlanta, Ga.—p. 951.
25 Difficulties and Complications of Sphenopalatine Ganglion Injection. H. L. Pollock, Chicago.—p. 958.
26 Intramural Malignant Tumor of Lateral Wall of Nasopharynx. E. P. Norcross, Chicago.—p. 967.
27 Relation of Autointoxications to Acute Membrane Disturbances. S. F. Snow, Syracuse, N. Y.—p. 973.
28 Sequestrum of Labyrinth. L. M. Hubby, New York.—p. 980.
29 Diagnosis and Operation of Sinus Thrombosis. J. Holinger, Chicago.—p. 985.
30 Study of One Hundred Cases of Mastoiditis and Its Complications, Requiring Operation. J. W. Downey, Jr., Baltimore.—p. 994.
31 Upper Respiratory Mucous Membrane as Key to Error in Metabolism. C. W. Stickle, Brooklyn.—p. 1006.
32 Two Maxillary Sinuses in one Maxilla. O. H. Horrall and H. F. Rawlings, Chicago.—p. 1015.
33 Advantages of Denker Over Other Operations on Maxillary Antrum, with Review of Twenty-One Cases After this Method. W. L. Simpson, Memphis, Tenn.—p. 1019.

Annals of Surgery, Philadelphia

March, LXV, No. 3

34 *Place of Radium in Surgery. E. M. Foote, New York.—p. 273.
35 *Intrathyroid Injections of Boiling Water in Hyperthyroidism. J. C. O'Day, Portland, Ore.—p. 279.
36 Treatment of Bony Defects of Lower Jaw; Report of Cases. C. A. McWilliams, New York.—p. 283.
37 *Studies in Plastic Surgery of Face. J. F. Esser, Holland.—p. 297.
38 Traumatic Aneurysm of Temporal Artery; Report of Cases. J. S. Horsley, Richmond, Va.—p. 316.
39 Trend of Surgery in Empyema of Thorax. M. W. Ware, New York.—p. 320.

40 *Prognostic and Therapeutic Significance of Skeletal Metastases in Carcinoma of Breast. I. Levin, New York.—p. 326.
41 *Significance of Patulous Appendix. J. W. Squires, Charlotte, N. C.—p. 341.
42 Renal Tuberculosis; Report of Cases. A. G. Rytina, Baltimore. —p. 346.
43 Reduplication of Ureter; Report of Cases. J. F. Geisinger, Richmond, Va.—p. 355.
44 Case of Isolated Sprain Fracture of Trapezium Produced by Indirect Violence. J. L. Bendell, Albany, N. Y.—p. 364.
45 Artificial Cell Proliferation with Horse Serum in Treatment of Burns. E. P. Robinson, New York.—p. 367.

34. **Place of Radium in Surgery.**—When the investigator in radium becomes so expert that he can say with definiteness, "Here is such and such a type of tumor and its bulk is approximately so and so. I know from experience that I can cause its entire disappearance with so much radium applied for so many hours," Foote thinks it will be time enough to advise radium in primary operable cases.

35. **Intrathyroid Injections of Boiling Water in Hyperthyroidism.**—O'Day claims that in seventeen cases treated by this method nothing but good has resulted, even in those first treated, when lack of experience was accompanied by its corresponding undeveloped technic.

37. **Plastic Surgery of Face.**—Esser reports cases of use of skin from the neck to replace defects; plastic operations about the mouth and epidermic inlay.

40. **Skeletal Metastases in Carcinoma of Breast.**—A clinical and roentgenologic study of ten cases reported by Levin shows that the skeletal metastases undoubtedly were present in all of them at the time of the operation. Pain in the different parts of the skeleton either appeared before or soon after the operation. The roentgenograms taken on admission to the hospital showed usually an extensive involvement of the bone, and the identical condition was found at the necropsy All this shows that the metastases were of long standing. Statistical investigations indicate that skeletal metastases of carcinoma may be very slow in their development. It may take years before clinical manifestations of any kind present themselves. The microscopic study of these cases by Levin showed that osteoplasia and osteomalacia are usually present side by side, and only in one case osteosclerosis, or new bone formation, predominates, while in another osteoporosis, or the destruction of the old bone, is mainly evident. The mechanism of the bone destruction in metastases of carcinoma differs from the one observed in inflammatory osteoporosis.

In Levin's cases carcinoma cells, as well as the small connective tissue stroma cells, are found in close immediate apposition to the walls of the lacunae. The carcinoma cells were so frequently the only cellular elements within the lacunae of the bone that there cannot be any doubt that carcinoma cells act as direct osteoclasts. The impression gained by Levin is that the small stroma cells only subsequently enter between the bone and the carcinoma cells. The osteosclerosis, or the extensive formation of new bone tissue, is characteristic of skeletal metastases. The radical operation for a malignant tumor means a complete eradication of all tumor tissue from the organism. It is patent that a radical operation in this sense of the word is impossible as long as a skeletal metastasis was diagnosed before the operation. It would seem that in the overwhelming majority of all the cases of carcinoma of the breast the best surgical methods of treatment do not completely eradicate the disease, but only prolong life. But on the basis of the latter interpretation of the therapeutic results in carcinoma of the breast, skeletal metastases give a better prognosis than metastasis in other organs, since they are much slower in their development and may therefore be more readily controlled.

41. **Significance of Patulous Appendix.**—It is Squires' belief that when the muscular contraction at the appendiceal orifice, the valve of Gerlach, the peristalsis, or whatever the mechanism is that guards the appendiceal orifice, first becomes incompetent there results a compensatory hyperstalsis of the appendix. And gradually, for some reason, probably the increased pressure of fecal material, there is a failure of compensation and the appendix can no longer empty. It is on the same principle as the changes occurring in a heart lesion. There is first a compensatory hypertrophy of the heart, later a failure of compensation. In the appendix there is first a compensatory hyperperistalsis, later a failure of peristalsis. There is a roentgenologic symptom syndrome associated with the patulous appendix, the detection of which is sufficient evidence of an abnormal appendix. A patulous appendix, even though its drainage is good, is abnormal. The roentgenologic evidence of the damage being done by the patulous appendix is present in both the stomach and ileocecal region.

Boston Medical and Surgical Journal

March 22, CLXXVI, No. 12

46 *Neurologic Aspects of Food Poisoning. A. W. Fairbanks, Boston. —p. 413.
47 Seminal Vesiculitis and Prortatitis Treated by Vesiculotomy and Prostatic Drainage. J. H. Cunningham, Jr., Boston.—p. 422.
48 Feeblemindedness as Seen in Court. V. V. Anderson, Boston.—p. 429.
49 Proposed Health Insurance Legislation. F. W. Anthony, Haverhill. —p. 431.
50 Wise Preliminary to Adoption of Any Compulsory Health Insurance Act. E. A. Codman, Boston.—p. 435.

46. **Neurologic Aspects of Food Poisoning.**—Instances of food poisoning in which an unknown toxin manifested a conspicuously selective action on the nervous system are reported by Fairbanks. Fish was responsible for the illness of these people. It was apparently in good condition when obtained. It was purchased in a small town, where presumably the rest of it was sold and where, so far as known, no other instances of similar illness occurred. It was kept in a refrigerator four hours, then baked and immediately eaten. From this refrigerator other food, placed therein after the fish poisoning occurred, caused illness in several people, whereas the same food eaten before it had been in the refrigerator caused no illness whatever. Moreover, the individual who cleaned the refrigerator, who was not a member of the family, and who did not partake of any of the food that made the others ill, was also slightly ill afterward. This would seem to indicate that the icebox was infected and that a bacterial toxin was responsible for the illness. As it had been in constant use and no food taken therefrom had caused illness, until after the fish had been kept therein, it would seem that the fish must have been in some direct way responsible for the contamination of the refrigerator. If so, it must have been to some extent infected when placed in the refrigerator. The appearance of the nervous phenomena occurred with striking uniformity twenty-one days after the onset of the gastric symptoms.

Canadian Medical Association Journal, Toronto

March, VII, No. 3

51 Functional Reeducation and Vocational Training of Disabled Soldiers. E. M. von Eberts, Montreal.—p. 193.
52 Sphagnum Moss: Surgical Dressing. J. B. Porter, Montreal.—p. 201.
53 End Results of Various Disabilities of Returned Soldier. E. H. Reed, Calgary, Alberta.—p. 208.
54 Treatment of Syphilis. H. K. Detweiler, Toronto.—p. 213.
55 Medical Treatment of Obstetric Cases. H. C. Swartzlander, Oyen, Alberta.—p. 222.
56 *Obtaining Blood for Diagnostic Purposes in Infancy; Preliminary Report on Longitudinal Sinus Transfusion. E. M. Tarr, Montreal.—p. 226.
57 Newer Views on Ventilation. A. Fisher, Calgary, Alberta.—p. 229.
58 Ability of Mothers to Nurse Their Infants. A. Brown, Toronto. —p. 241.

56. **Obtaining Blood for Diagnostic Purposes in Infancy.**—Tarr recommends the longitudinal sinus route. He has entered the sinus 207 times for blood and has been disappointed but three times. Dextrose solutions have been administered sixty-four times in forty-nine infants. Salvarsan and diarsenol have been administered to eight infants under 2 and to one child 28 months old. Nineteen cases of so-called acidosis in infants under 2 years were treated with sodium bicarbonate solution intravenously with fifteen recoveries. One child 3 years old was given, during a period of five days, 980 c.c. of the solution. The patient was discharged well on the tenth day after admission. In this case the fontanel was rather cartilaginous and a gold plated lumbar puncture needle was used. Tarr also uses this route for blood transfusion.

Delaware State Medical Journal, Wilmington

March, VIII, No. 3

59 Recent Work at American Ambulance, Paris, France. R. R. Spahr, Wilmington.—p. 4.

Illinois Medical Journal, Chicago

March, XXXI, No. 3

60 *Biochemistry of Topical Applications with Special References to Use of Boric Acid in Septic Infections. E. H. Ochsner, Chicago. —p. 139.
61 Removal of Gallbladder. E. S. Judd, Rochester, Minn.—p. 144.
62 Etiologic Relationship Existing Between Gastric Ulcer and Gastric Cancer. F. Smithies, Chicago.—p. 149.
63 Surgical Complications of Pregnancy. W. C. Danforth, Evanston. —p. 156.
64 Medical Complications of Pregnancy. R. A. Scott, Evanston.—p. 159.
65 Treatment of Specific Diseases by Nonspecific Foreign Protein. F. B. Lusk, Chicago.—p. 162.
66 Modern Aspect of Cancer Problem. G. Kolischer, Chicago.—p. 163.
67 Adiposis Dolorosa (Dercum's Disease); Report of Case. A. G. Wittman, Peoria.—p. 165.
68 Amebic Dysentery. J. W. McGuire, Chicago.—p. 168.
69 Hemorrhoids, Their Cause and Treatment. F. A. Turner, Rockford.—p. 174.
70 Some Forms of Insanity Most Frequently Met by Physicians. C. H. Anderson, McLeansboro.—p. 178.
71 Pyelitis Treated Successfully with Silvol. J. C. R. Wettstein, Effingham.—p. 181.

60. See THE JOURNAL, Jan. 20, 1917, p. 220.

Iowa State Medical Society Journal, Des Moines

March, VII, No. 3

72 Cancer Problem. A. M. Pond, Dubuque.—p. 87.
73 Rheumatism; Report of Cases. J. W. Shuman, Sioux City.—p. 90.
74 Some Practical Points in Treatment of Diseases of Children. F. G. Murray, Cedar Rapids.—p. 94.
75 Tuberculosis of Kidney. C. M. Wray, Iowa Falls.—p. 98.
76 Acidosis as Surgical Complication. W. M. Shirley, Carroll.—p. 101.
77 Early Diagnosis and Surgical Treatment of Gallbladder Disease. L. C. Kern, Waverly.—p. 103.
78 Treatment of Pneumonia. R. E. Gunn, Deep River.—p. 107.
79 Throat Infection Complicated by Mastoiditis. C. F. Howland, Des Moines.—p. 109.

Journal of Infectious Diseases, Chicago

April, XX, No. 4

80 *Nonfiltrability of Typhus Virus. P. K. Olitsky, New York.—p. 349.
81 Intracutaneous Typhoidin Reaction. Preparation and Properties of Antigen. K. F. Meyer and C. R. Christiansen, San Francisco.—p. 357.
82 *Id. Nature and Specificity of Reaction. K. F. Meyer and C. R. Christiansen, San Francisco.—p. 391.
83 *Id. Relation of Cutaneous Hypersensitiveness to Experimental Immunity and Infection. K. F. Meyer, San Francisco.—p. 424.
84 *Treatment of Experimental Tuberculosis in Guinea-Pigs and Rabbits by Taurin, Alone and in Combination with Gold Chlorid and Sodium Oleate. M. Takeoka, Berkeley, Calif.—p. 442.
85 Differentiation of Paratyphoid Enteritidis Group. E. O. Jordan, Chicago.—p. 457.

80. **Nonfiltrability of Typhus Virus.**—In the experiments recorded by Olitsky it has been conclusively demonstrated that the infective agent of typhus belongs to the group of nonfiltrable viruses. This agrees with the previous observation that *Bacillus typhi-exanthematici* is nonfiltrable.

82. **Nature and Specificity of Typhoidin Reaction.**—Cutaneous hypersensitiveness of rabbits to typhoidin and similar preparations Meyer and Christiansen believe is, in all probability, the result of sensitization with typhoproteins or similar bacterial proteins. The hypersusceptibility to extract preparations of cultures can be transferred passively and small amounts of typhoidin are capable of producing local sensitization of the skin to subsequent injections of the same, or similar, antigens. In a fairly high percentage of hyperimmune or infected rabbits, nonspecific skin reactions follow the injection of extracts of pure bacterial proteins or microorganisms neither biochemically nor immunologically related to the organisms with which the animal has been treated. Some typhoid immune rabbits show nonspecific reactions with paratyphoid and *B. coli* extract, which can be considered as group reactions; but frequently such animals, when highly immunized, will also give reactions with heterologous antigens not in the least related to *B. typhosus*. These reactions may be explained as the probable result of nonspecific sensitization with protein substances common to all bacteria or vegetables in general.

83. **Relation of Cutaneous Hypersensitiveness to Experimental Immunity and Infection.**—Meyer's experiments suggest that careful quantitative tests with pure typhoprotein should be made on carriers of human typhoid. A simple test like the typhoidin test, if it should develop that this test does detect carriers, would be a valuable weapon in the hands of the health officer in the eradication of typhoid from communities in which the infection is apt to be perpetuated in this manner. A positive typhoidin skin reaction in a rabbit does not indicate that this animal will resist a subsequent intravenous injection of living typhoid bacilli, or that the animal is so protected that it will not become a chronic carrier of bacilli in gallbladder or liver. Cutaneous hypersensitiveness to typhoidin is most marked in rabbits infected with typhoid bacilli. Carriers of bacilli in gallbladder and liver develop skin reactions which apparently vary directly with the degree of the inflammatory process in the organs.

84. **Taurin in Treatment of Experimental Tuberculosis.**—Facts suggesting some relation between constituents of the bile and a resistance to infection with the tubercle bacillus, led Takeoka to incorporate the most characteristic amino-acid of the bile, taurin, in a combination treatment with a colloidal mixture of sodium gold chlorid and sodium oleate in experimental tuberculosis in guinea-pigs and rabbits. Apparently as favorable results were obtained with taurin alone as with taurin combined with sodium gold chlorid and sodium oleate. Guinea-pigs were infected with either bovine or human strains of tubercle bacilli. The results were similar with both. In nearly every instance the controls all died before any of the treated animals, and whereas the controls lost weight almost uniformly, the treated animals gained. The contrast in the extent of visible tuberculosis between controls and treated animals was marked. Whereas the process was advanced in the controls, it was arrested and in some instances apparently cured in the treated animals. The success of the treatment varied naturally in accordance with the variations in infecting dose, the route of inoculation, and the time of beginning treatment. The process of the disease was arrested and apparently cured when treatment was begun as late as three weeks after infection.

Journal of Laboratory and Clinical Medicine, St. Louis

March, II, No. 6

86 Spirochetes. H. Noguchi, New York.—p. 365. To be continued.
87 *Effect of Certain Drugs on Skin Reactions. J. A. Kolmer, S. L. Immerman, T. Matsunami and C. M. Montgomery, Philadelphia. —p. 401.
88 *Distribution of Blood Sugar as Regards Corpuscles, Plasma and Whole Blood in Health and Disease in Man. R. B. H. Gradwohl and A. J. Blaivas, St. Louis.—p. 416.
89 New Kind of Long Paper Kymograph. D. E. Jackson, St. Louis. —p. 424.
90 Construction of Clinical Laboratory Equipment. M. J. Breuer, Lincoln, Nebr.—p. 427.
91 *Rapid Examination of Occult Blood by Wagner Benzidin Method. W. T. Vaughan, Boston.—p. 437.

87. **Effect of Certain Drugs on Skin Reactions.**—The authors found that the iodids and particularly potassium iodid influenced the luetin and prodigiosis intracutaneous tests to a marked extent. Normal nonsyphilitic persons, reacting negatively in the luetin test, may show marked reactions when tested after the oral administration of 60 or more grains of potassium iodid. The bromids of potassium and sodium in the same dosage were found to have a similar but less marked influence. The chlorids of potassium and ammonium in the same dosage were found to influence the prodigiosin reactions but not the luetin reactions except to a very slight extent. The administration of the protiodid of mercury influenced the luetin reaction to some extent. It is probable that the administration of larger doses of these drugs would exert a more marked influence on skin reactions. Ether and chloroform anesthesia did not appear to influence skin reactions. Substances most likely to excite inflammatory reactions in the skin appear to be most readily influenced by the iodids and to some extent by bromids; intracutaneous tests with agar-agar, prodigiosin and ordinary luetin were more readily influenced

by these drugs than the reactions following the injection of a luetin of washed spirochetes and free of culture medium. Cutaneous tests are not as readily influenced by these drugs as intracutaneous tests. Conjunctival tests among normal rabbits to tuberculin were apparently not influenced. Cutaneous and intracutaneous reactions to tuberculin among persons reacting positively to both, appear to be rendered more extensive by potassium iodid and to a lesser extent by potassium bromid. Anaphylactic reactions to luetin in syphilitic persons appear to be rendered more extensive by potassium iodid and potassium bromid. The oral administration of potassium iodid and to a lesser extent of potassium bromid, increased the phagocytic power of the blood serum for B. prodigiosis; the increased severity of skin reactions in persons taking these drugs may be due to heightened leukocytic infiltration and phagocytosis about the injected material or to an increase of tryptic activity through the saturation of fatty acid radicals according to the hypothesis of Jobling and Petersen. It is suggested that it is probable that these drugs have influenced the luetin reactions as clinically applied and have been responsible in part for the divergent results observed and reported. Physicians are urged to be careful to rule out the possible influence on these drugs before conducting skin reactions.

88. **Distribution of Blood Sugar.**—Using the latest methods of sugar analysis in blood, namely, that of Lewis and Benedict as modified by Myers and Bailey, Gradwohl and Blaivas found that the amount of sugar is practically the same in the whole blood, plasma and cells. This is in the main in perfect agreement with the work of Tachau who used the older technic of sugar estimation. This seems to disprove the theoretical views of some of the older physiologists who held that a part of the sugar in the blood was in a state of loose combination with some other substance.

91. **Examination of Occult Blood by Benzidin Method.**—The Wagner benzidin test for occult blood is recommended by Vaughan on account of its ease, rapidity and comparative cleanliness in execution, and on account of its reliability. Meat fibers, pus and the usual drugs and foods ingested do not interfere with the reaction. The ordinary hospital diet, with meat, gives a negative reaction; but, if sufficient quantities of rare meat be taken, the stool reaction may become definitely positive.

Medical Record, New York

March 24, XCI, No. 12

92 Medical Flanders Before French Revolution. J. B. Stein, New York.—p. 487.
93 Effects of Altitude and Depression on Blood Pressure. H. Stamp, Philadelphia.—p. 499.
94 Some New Medicolegal Questions. T. D. Crothers, Hartford, Conn. —p. 501.
95 Is Appendicitis a Transmissible Disease? M. D. Bloomfield, Philadelphia.—p. 502.
96 Temporosphenoidal Abscess of Brain; Operation; Recovery. I. Grushlaw, New York.—p. 503.
97 Latent Heart Weakness Causing Obscure Congestive Disorders. M. B. Leviton, Chicago.—p. 504.

New York Medical Journal

March 24, CV, No. 12

98 Bacteriology of Influenza. W. H. Park, New York.—p. 529.
99 Clinical Types of Influenza. N. E. Brill, New York.—p. 530.
100 Treatment of Influenza. S. A. Brown, New York.—p. 536.
101 Treatment of Tuberculosis with Cyanocuprol. M. Otani, Tokyo, Japan.—p. 537.
102 Pyorrhea Alveolaris. A. H. Merritt, New York.—p. 543.
103 Gastromesenteric Ileus. J. W. Moore, Louisville, Ky.—p. 544.
104 Conservative Treatment of Diseases of Nasal Sinuses. E. L. Vansant, Philadelphia.—p. 547.
105 Folliculitis Urethralis. J. Kaufman, New York.—p. 549.
106 Local Vaccine. J. A. Pratt, Aurora, Ill.—p. 552.

Pennsylvania Medical Journal, Athens

March, XX, No. 6

107 *Typhoid and Typhophors. S. G. Dixon, Harrisburg.—p. 389.
108 Carriers in Schools with Special Reference to Diphtheria. H. J. Benz, Pittsburgh.—p. 395.
109 *Significance of Hunger Pain. J. W. Luther, Palmerton.—p. 399.
110 *Facts and Fallacies Concerning Electrotherapeutics. W. L. Clark, Philadelphia.—p. 405.
111 *Railroad Phase of First Aid. J. B. Hileman, Harrisburg.—p. 412.
112 *Injuries Common to Policemen and Firemen and Their First Aid Treatment. H. R. Owen, Philadelphia.—p. 413.
113 Beginnings and Needs of Philadelphia in Postgraduate Medical Study. J. B. Roberts, Philadelphia.—p. 421.
114 Ambulance of American Hospital of Paris. L. F. Stewart, Clearfield.—p. 427.

107, 109, 110. Abstracted in The Journal, Oct. 28, 1916, p. 1328.

111, 112. Abstracted in The Journal, Nov. 4, 1916, pp. 1394 and 1395.

Washington Medical Annals

March, XVI, No. 2

115 *Acute Pulmonary Abscess Treated with Artificial Pneumothorax. W. D. Tewksbury, Washington, D. C.—p. 73.
116 Case of Intestinal Obstruction Following Cesarean Section. S. R. Karpeles, Washington, D. C.—p. 79.
117 Breast Feeding and Some of Its Problems. J. Foote, Washington, D. C.—p. 82.
118 *Roentgen Therapy of Exophthalmic Goiter and Hyperthyroidism. C. A. Simpson, Washington, D. C.—p. 92.
119 Gliosarcoma of Insula, Illustrating Focal Diagnosis. T. A. Williams, Washington, D. C.—p. 99.
120 Some Experiences with Chloroform Anesthesia. L. Eliot, Washington, D. C.—p. 101.
121 Case of Aortic Aneurysm. H. C. Macatee, Washington, D. C. —p. 107.

115. **Acute Pulmonary Abscess Treated with Artificial Pneumothorax.**—Two cases are reported by Tewksbury to show that artificial pneumothorax is a rational method of treatment in all cases having a communication with bronchus. It gives promise of very appreciably lowering the mortality and raising the percentage of cure in acute abscess of the lung.

118. **Roentgen Therapy of Exophthalmic Goiter and Hyperthyroidism.**—Of seventeen cases reported by Simpson four were failures. Of the four, one was a carcinoma of the thyroid. In most of the cases there has been a decrease in the size of the tumor, in a few the size of the neck has become normal. The exophthalmus was not influenced. The pulse rate was lowered in all the cases.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

October, 1916, XXXIX, Parts 3-4

1 *Possible Functions of Cerebrospinal Fluid. W. D. Halliburton. —p. 213.
2 Intracranial Aneurysms. E. G. Fearnsides.—p. 224.
3 *Degeneration of Muscle Following Nerve Injury. F. Roberts.— p. 297.
4 Disturbances of Sensations in Cases of Cerebral Lesions. T. G. Brown and R. M. Stewart.—p. 348.
5 Records of Speech in Disseminated Sclerosis. E. W. Scripture. —p. 455.
6 *Factors which Govern Penetration of Arsenic (Salvarsan) and Anilin Dyes into Brain; Bearing on Treatment of Cerebral Syphilis. J. McIntosh and P. Fildes.—p. 478.

1. **Possible Functions of Cerebrospinal Fluid.**—The cerebrospinal fluid, which is merely Locke's modification of Ringer's solution, Halliburton believes performs certain important functions. The view he has been led to take is that the nervous mechanism, being so sensitive, so easily influenced by anything unusual, therefore the neurons must be bathed in an ideal physiologic saline solution to maintain their osmotic equilibrium; the trace of protein it contains is probably quite sufficient for nutritive processes, and is no doubt the kind of protein particularly suited to repair the small amount of wear and tear which is the result of nervous action. The sugar, just as in Locke's solution, would serve for a supply of energy. The choroidal epithelium, in its wise choice of a suitable circumambient medium for the neurons, is really exercising a protective function. In order to keep out harmful proteins (toxins and the like), the comparatively harmless ones are kept also, almost completely; all share the same process of exclusion. This protective action applies, in addition, to the majority of soluble drugs; this may operate so as to be detrimental in disease conditions. The nonaccess of metallic and other poisons to the nervous elements is such a sine qua non for their health, that during those periods

when such substances are given for the relief of disease, or the slaughtering of parasites, the choroidal cells are unable to change their habits and do not allow the drugs to get through. Such, Halliburton believes, is the real significance of the simple composition of this remarkable secretion.

3. **Degeneration of Muscle Following Nerve Injury.**—In cases of peripheral nerve injury there is usually no doubt as to whether the muscle is degenerated or not. The question of practical importance is the extent of the injury which the nerve has suffered. To this question, it must be admitted, electric reactions give but a limited answer, the chief reason being that the electric response does not go *pari passu* with voluntary power. In cases of gunshot wounds of nerves, if the full reaction of degeneration is given by wasted paralyzed muscles, if the sensory loss is full and trophic changes well developed, exploratory operation is advisable without delay, provided the wound is aseptic. Cases in which the muscles give the reaction of degeneration, in which the wasting is slight, in which the sensory loss is not complete, and when the trophic changes are not developed, should be watched first for a couple of months or so. Injuries of this class usually recover without operative interference. As to the question of subsidiary treatment by electricity and massage, Roberts considers the constant current interrupted by a metronome to be the best. This should be done for at least fifteen to twenty minutes daily. Care must be taken that the current does not spread so as to stimulate the healthy muscles of the opposite side of the limb. If this is done, the paralyzed muscle is damaged by being stretched. For this reason the method of immersing the whole limb in an electric bath is strongly to be deprecated. The greater spread of current which occurs when the condenser is used makes this instrument less efficient as a means of treatment than the interrupted constant current.

6. **Penetration of Arsenic and Anilin Dyes Into Brain.**—McIntosh and Fildes found that certain dye substances can pass directly from the blood to the brain substance proper without being found in the cerebrospinal fluid, while others fail to penetrate into the brain. The chief factor which governs the passage of the dyes is their solubility reactions. This is a peculiar solubility and not a general lipoid solubility. It corresponds to a solubility in chloroform and in water or perhaps to their partition coefficient in these liquids. The present day arsenical remedies are, to some extent, inefficient in the treatment of syphilis of the central nervous system because they do not possess the necessary solubility to allow them to pass from the blood vessels into the brain substance. Their relative inefficiency has nothing to do with their absence from the cerebrospinal fluid.

British Journal of Ophthalmology, London

January, I, No. 1

7 Blood Pressure in Eye and Its Relation to Chamber Pressure. P. Smith.—p. 4. To be continued.
8 Pathology of Choroidal Melanomas. R. F. Moore.—p. 26.
9 Removal of Foreign Bodies by Means of Giant Magnet. G. H. Pooley.—p. 30.
10 Technic of Haab and Small Magnets in Extraction of Intra-Ocular Foreign Bodies. M. H. Whiting and C. Goulden.—p. 32.
11 Ring Magnet. T. H. Butler.—p. 46.

Journal of Pathology and Bacteriology, Cambridge

December, 1916, XXI, No. 1

12 *Thymusectomy and Its Relationship to Rachitis. J. M. Renton and M. E. Robertson.—p. 1.
13 *Isolation of Tubercle Bacilli from Sputum and Determination of Their Type. C. Y. Wang.—p. 14.
14 *Studies on Thyroid. W. Edmunds.—p. 23.
15 New Methods for Production of Antistreptococcal Serums. A. H. Caulfeild.—p. 28.
16 Biochemistry of Loss of Power of Tubercle Bacillus to Stain with Carbol-Fuchsin. A. H. Miller.—p. 41.
17 *Some Streptothrixes Isolated from Tumors. A. S. Leyton and H. G. Leyton.—p. 47.
18 *Human Bone and Joint Tuberculosis. A. S. Griffith.—p. 54.
19 *Unusual Malformations of Heart in Case of Congenital Heart Disease. J. I. Robertson.—p. 78.
20 Transplantation of Bone Marrow into Spleen; Experimental Observations on Myeloid Metaplasia. Y. Matsuoka.—p. 84.
21 *Vitamins, Amino-Acids and Other Chemical Factors Involved in Growth of Meningococcus. D. J. Lloyd.—p. 113.

12. **Relation of Thymusectomy to Rachitis.**—It is held by Renton and Robertson that spontaneous rickets gives rise to exactly the same symptoms as Basch, Klose, Vogt and Matti attribute to thymusectomy, if one excepts the adipose stage of Klose and Vogt. The removal of the thymus does not make the animals more susceptible to spontaneous rickets, and if they develop it, they do so at the same time and in the same manner as the controls. Thymusectomy of itself does not appear to cause any symptoms. The authors are thus of the opinion that removal of the thymus cannot be held responsible for the onset of rickets or similar bony changes, and the evidence they have obtained points to the changes which have been credited to loss of the thymus really being due to the development of spontaneous rickets in young animals. These conclusions are based on animal experiments.

13. **Isolation of Tubercle Bacilli from Sputum.**—Twenty-eight of the twenty-nine bovine strains isolated by Wang from the sputum, produced, in the rabbit, either no tuberculosis or only a retrogressive tuberculosis, similar to that produced by bacilli of the "human" type. The remaining culture showed well marked cultural characteristics of the "bovine" type, and was of high virulence for the rabbit. A rabbit inoculated with this strain died during the sixth week after injection, and, on examination, showed extensive tuberculosis of a rapidly progressive type. The virulence of this culture was again tested, and the same extensive tuberculous lesions were found. The cultural characters and the pathologic lesions in this case, therefore, agreed in essential particulars with that produced by the tubercle bacilli in the "bovine" type. Wang says that the conclusion can safely be drawn that, by means of the rabbit tests alone, tubercle bacilli as they occur in lesions in the human body can be divided into two distinct groups. One group possesses identical cultural characters and virulence for rabbits with those exhibited by tubercle bacilli isolated from bovines, and may be thus termed the "bovine" type; the other group has a low virulence for rabbits, is practically always obtained from a human source, and may be termed the "human" type.

14. **Compensating for Lost Thyroid Function.**—Sixteen attempts were made by Edmunds to keep dogs alive after total excision of both thyroid and parathyroids by milk feeding and, if necessary, intravenous injections of calcium lactate, but in only six out of sixteen was the treatment successful, and in them it was probably necessary, as was done, to continue the calcium feeding to prevent tremors, ataxia, convulsions and death. If the administration of calcium in milk by the mouth fails to keep off the symptoms, intravenous injections of the lactate of calcium may be given. These may or may not be successful in preventing symptoms and death; if they are, they generally succeed in the first three months or so; after that the animal may live for months or even years on the milk with added calcium. From this it would appear that after a time some change occurs in the animal, and this would seem to be a compensating hypertrophy of the pituitary. With respect to treatment, partial or complete loss of the parathyroids in thyroid operations can be treated with the parathyroid preparations now on the market. In the same way can be treated cases of disease suspected of being due to parathyroid insufficiency. An alternative, or additional, treatment is by the administration of calcium, which, as Edmunds has just seen, may succeed where parathyroid preparation fails; but it is necessary to give the calcium in large doses. Five or 10 grains of lactate of calcium is of no use. Ten grains corresponds to the amount of calcium in 2 ounces of milk, and it is necessary to put the patient on a diet mainly or wholly of milk, and it may be advisable to give, in addition, intravenous injections of lactate of calcium.

17. **Streptothrices Isolated from Tumors.**—The Leytons examined twenty-one human tumors and from sixteen they have isolated a streptothrix. Eight failed to grow after the second generation, and two have since died out, so that at present six strains are living and growing. Of all these, one was obtained directly from the patient's blood; eleven were grown from tumors removed by operation within the preced-

ing twenty-four hours, and four were isolated from post-mortem room material. Nine tumors were of mammary origin, and of the remainder, one each came from the tongue, larynx, mediastinum, gallbladder, abdomen, cervix uteri and skin of the foot. Whether the streptothrix bears any relation to the formation of tumors the authors are not ready to say. It is significant that in one case after feeding on streptothrix a mediastinal tumor was found in a rat, and the same type of streptothrix was recovered from the tumor. They also have evidence that vaccination with streptothrix will protect a certain percentage of rats from inoculated sarcoma.

18. **Human Bone and Joint Tuberculosis.**—The total number of cases investigated by Griffith is 155. This series shows that infection in bone and joint tuberculosis may be acquired by way either of the respiratory tract or of the alimentary tract. The total number of strains isolated from 141 patients is 216, of which 82 (representing 73 viruses) were obtained direct. Twenty-five yielded cultures of bovine tubercle bacilli, 111 cultures of human tubercle bacilli and 5 atypical cultures.

19. **Unusual Malformations of Heart.**—Briefly, the following conditions were present in the heart which Robertson obtained from a boy 13½ years of age. The heart was situated in the left thorax, the afferent vessels were normal; the atria were transposed; the ventricles were transposed; while the efferent vessels were straight and transposed. The course of the aorta beyond the heart was normal, as it crossed the left bronchus and descended along the left of the spinal column. It was therefore a case of dextrocardia of the atrial and ventricular chambers, with transposition (not reversed torsion, which would have completed the mirror picture of a normal heart) of the efferent vessels, but there was no *situs inversus*.

21. **Vitamins, etc., in Growth of Meningococcus.**—Lloyd states that the primary cultivation of the meningococcus in vitro is only possible in the presence of certain accessory growth factors (the so-called vitamins) present in blood, serum, milk and other animal fluids and probably present also in vegetable tissues. The meningococcus, after isolation from the body, gradually develops a change in its metabolism of such a nature that it becomes increasingly independent of a vitamin supply in the medium. Old laboratory strains need no additional vitamin supply if the medium contains an abundant supply of free amino-acids. Culture of the meningococcus must be kept permanently in a moist atmosphere in order to retain their vitality.

Practitioner, London

March, XCVIII, No. 3

22 Dreams and Their Interpretation. R. Armstrong-Jones.—p. 201.
23 Cancer Problem and World War. W. S. Bainbridge.—p. 220.
24 Strangulated Hernia; Report of Cases. W. S. Handley.—p. 235.
25 Labyrinthine Focal Infections. M. Yearsley.—p. 245.
26 Transfusion of Blood with Reference to Pernicious Anemia. O. Leyton.—p. 251.
27 Inheritance of Normal and Pathologic Traits in Man. H. Drinkwater.—p. 257.
28 Salvarsan and Its Substitutes. J. L. Bunch.—p. 279.
29 Simplified Technic for Administration of Neosalvarsan. C. E. Jenkins.—p. 287.
30 Two Cases of Sudden Death After Kharsivan Injection. S. Vassallo.—p. 290.

Annales de Gynécologie et d'Obstétrique, Paris

January-February, LXXII, pp. 385-448

31 *Welfare Work for Infants in Paris District during Second Year of War. (De la protection de l'enfance pendant la deuxième année de guerre.) A. Pinard.—p. 385.
32 *The Functions of the Corpus Luteum. (Sur les rôles du corps jaune.) C. Mulon.—p. 415. To be continued.

31. Reviewed in these columns, February 10, p. 491.

32. **The Functions of the Corpus Luteum.**—Mulon remarks that only quite recently has the corpus luteum been promoted to the rank of a glandular organ with an internal secretion. As soon as this was established, various functions were attributed to it, so that the corpus luteum, regarded for so long as nothing but a cicatrix, is now held responsible as the *primum movens* of the entire genital physiology in the female. She discusses in turn the twenty-six various functions that have been attributed to the corpus luteum. Many of them are exactly contradictory, but arguments and data have been advanced in favor of each as she describes. The article is to be continued.

Annales de Médecine, Paris

January-February, IV, No. 1, pp. 1-107

33 *Typhoid and Paratyphoid Bacilli in the Stools. M. Labbé and G. Canat.—p. 1.
34 Clinical Evolution and Treatment of War Wounds of the Chest. L. Reverchon and S. I. De Jong.—p. 12.
35 Fractures of the Sixth Cervical Vertebra in Diving. (Plongée de tête par fond insuffisant. Fracture de la sixième vertèbre cervicale.) J. A. Sicard and L. Rimbaud.—p. 34.
36 Elimination of Chlorids in Two Cases of Dropsical Beriberi. P. Pagniez and P. Vallery-Radot.—p. 45.
37 *Pleural Tuberculosis and Tuberculous Polyserositis. P. Ameuille.—p. 55.
38 *Etiology, Evolution and Prognosis of Acute War Nephritis. F. Trémolières and L. Caussade.—p. 73.
39 Picric Acid Intoxication and Picric Jaundice. P. L. Marie.—p. 85.

33. **Typhoid and Paratyphoid Bacilli in the Stools.**—Canat relates that he obtained positive findings in 60 of the 198 examinations of the stools from 128 typhoid or paratyphoid cases. The details of the whole number are tabulated for comparison. The bacilli appear early in the stools but grow less with each week. They were found in 50 per cent. of the grave cases but only in 30 per cent. of the milder ones. In 102 patients with various affections other than paratyphoid or typhoid, paratyphoid bacilli were found in the stools of 8, but no typhoid bacilli carriers were encountered.

37. **Pleural Tuberculosis.**—Ameuille relates that in the last ten months of the 2,600 tuberculous soldiers he has examined, he found that the serous membranes were involved in 270. Isolated tuberculous pleuritis was the most frequent, but in a number of the cases the peritoneum, pericardium, meninges or synovial membranes were involved likewise or alone. As a rule, the pleurisy without effusion is the first process. Scarcely any of the men were over 24. The lung did not become involved often. The infection in the pleura is usually the result of the fanning into a flame of some old glandular, mediastinal or pleural process; direct contact infection is not needed to explain it.

38. **Acute Nephritis Among the Troops.**—In about 33 per cent. the kidney disturbances noted in the soldiers on active service are merely simple albuminuria. In 67 per cent. there is actual subacute nephritis with a tendency to dropsy. After six weeks or two months of hospital care the albuminuria disappears in about 10 per cent. It persists in 25 per cent. in minute proportions but varying with fatigue and diet and thus compelling a reserved prognosis notwithstanding the good general condition. The men with subacute nephritis were left with a tendency to edema in about 44 per cent. of the cases. If there is no cardiovascular derangement, the only relics left may be a residual albuminuria or albuminous nephritis. In 7 per cent. the nephritis passed into a chronic stage, some cases proving speedily fatal.

Archives de Médecine des Enfants, Paris

February, XX, No. 2, pp. 57-112

40 Diagnosis and Treatment of Congenital Stenosis of the Pylorus. C. G. Grulee and Dean Lewis (Chicago).—p. 57. To be continued.
41 Fatal Pneumococcus Infection in Three Newborn Infants. (Une petite épidémie de pneumococcie chez le nouveau né.) Condat.—p. 88.
42 *Pneumococcus Brain Abscesses in Boy of Six. Condat.—p. 92.
43 *Prophylaxis of Measles. (Prophylaxie de la rougeole.) J. Comby.—p. 94.

42. **Multiple Pneumococcus Abscesses in Brain of Boy of Six.**—The child had apparently succumbed the eighth day to acute meningitis, but necropsy revealed twelve pneumococcus abscesses the size of a nut scattered through and on the brain. They were unmistakably metastatic. The right lung showed traces of recent pneumonia.

43. **Prophylaxis of Measles.**—Comby describes the regulations that have been enforced in England and Wales since November, 1915, respective to notification and disinfection in cases of measles and German measles. He reproduces the official circulars that are distributed.

Bulletin de l'Académie de Médecine, Paris

February 20, LXXVII, No. 8, pp. 217-256

44 *Discussion of Measures for Welfare Work among Factory Workers' Infants. Doléris and others.—p. 222. Continuation.
45 Operative Correction of Stenosis of Trachea and Esophagus from War Wound; Two Cases. Guisez.—p. 254.

February 27, No. 9, pp. 257-306

46 Successful Extraction of Scrap of Shell in Anterior Mediastinum in Contact with Superior Vena Cava. E. Kirmisson.—p. 296.
47 Monomyoplegia from War Wounds of Peripheral Nerves. Mally and Corpechot.—p. 298.
48 Spontaneous Rupture of Right Auricle in Young Man with Infectious Endocarditis, Aneurysm of the Mitral Valve and Coronary Sclerosis. P. R. Joly.—p. 299.
49 *Child Welfare Work at Havre during the War. (L'enfance au Havre pendant la guerre.) L. Loir and H. Legangneux.—p. 303.

44. **Welfare Work for Factory Working Mothers and Their Infants.**—The discussion on this subject has continued several weeks in the Académie. Pinard declared that as the present laws grant an allowance to women only for the four weeks preceding delivery, the benefit therefrom is often annulled by the fact that no one can tell exactly when the delivery is going to occur. If the four weeks pass without the childbirth, she is not entitled to further allowance. Pinard insists that an allowance of 5 francs a day (about $1), should be given to every pregnant woman and every woman nursing a child less than 1 year old, if the women claim it. He adds that during the war the births have dropped to 60 per cent. of the 1909 figure. Instead of 760,000 births there were only 450,000 last year, so the amount to be paid out in this allowance he pleads for, is not such an overwhelming sum. This presupposes that the factory will refuse to accept pregnant women. He says that the munitions factories in England reject pregnant applicants for work, and that the manufacturers in certain towns in France have long made provision for their pregnant and nursing workers. Doléris presented a long list of industrial towns where factories provide a *chambre d'allaitement* where the women go at regular hours to suckle their babes. The manufacturers want the supply of workers kept up, and numbers of them have introduced innovations in the way of welfare work of various kinds for the mothers and the infants. But even at the best, Pinard exclaimed, "the factory is the killer of children—*tueuse d'enfants.*" Prenant voiced the fear that the factory may even in time annihilate the maternal instinct, adding that the whole question of welfare work for prospective mothers is on a different basis now from what it has ever been before as women are now doing men's work in so many lines. Senator Strauss took part also in the debate. While deploring the low birth rate, he declared that it did not average lower among factory workers than in other groups of women, and that the children born to the factory workers averaged high in the maternity records. He fears that exclusion of pregnant women from the factories will encourage sterility and abortions. Bar insisted that a working woman should not suffer in her material interests from bearing or suckling a child. On the contrary, it should be to her interest to do so.

49. **Infant Welfare Work at Havre.**—Loir's statistics show a considerable decline in the birth rate and rise in infant mortality. He declares that for the latter, congenital weakness is mainly responsible, the women working in the munitions factories bearing feeble infants from the deleterious influence of the overwork and the manipulation of chemicals. He emphasizes that the present methods of financial assisting of women at childbirth foster pauperism. The remedy for this is to give the financial aid to all women in this condition, without their having to beg for it.

Journal de Chirurgie, Paris

Concluding Number of Vol. XIII, No. 6, pp. 645-755

50 *Parotitis in Typhoid. P. Emile-Weil.—p. 709.

50. **Parotitis in Typhoid.**—This is only an abstract of the article by Weil, which was published elsewhere. He relates that in the course of severe typhoid he witnessed parotitis develop in nine cases. Five of the men died among the seven with suppurating parotitis. The two who recovered had been treated by squeezing out a spoonful of pus through the duct of Steno morning and night, followed by application of hot water compresses. In the two nonsuppurating cases the parotitis subsided in a week under the moist heat alone. This number of the *Journal de Chirurgie* contains no original articles. It completes the volume that was under way when the war broke out. This number is dated therefore December, 1915. It is now proposed to resume regular publication every two months. The first six numbers in 1917 are to be devoted to war surgery.

Lyon Chirurgical

1916, XIII, No. 6, pp. 837-974

51 Treatment of War Wounds and Diseases of Joints. (L'immobilisation et la mobilisation dans le traitement des maladies articulaires.) A. Broca.—p. 837.
52 Immobilization of War Wounds of Long Bones and Joints with Slats, with or without Plaster. (Immobilisation à l'aide d'attelles de store.) Eynard and P. Santy.—p. 864.
52 Treatment of Compound War Fracture of the Shaft of the Humerus. H. Alamartine.—p. 877.
54 Treatment of Wounds of the Skull. (Les blessures du crâne.) J. Boeckel.—p. 903.
55 *Local Anesthesia. (De l'anesthésie exclusivement locale à la novocaine-adrénaline en chirurgie.) P. A. Petridis.—p. 912.
56 *Histologic Study of Homoplastic Skin Grafts; Two Cases. G. Cotte and Dupasquier.—p. 947.
57 Hemangioma plus Lymphangioma; Two Cases. J. Bolognesi (Siena).—p. 957.
58 Restorative Operation for War Wound of Perineum Region. (Plaie par balle probablement explosive. Lésions d'éclatement du périnée postérieur avec section de l'urètre membraneux et du rectum. Restauration précoce. Bon résultat anatomique et fonctionnel.) J. Bosquette.—p. 963.

55. **Local Anesthesia.**—Petridis gives an illustrated description of his method of blocking the nerves by injecting a 0.05 per cent. solution of novocain in a 0.9 per cent. salt. solution, adding a little epinephrin as needed. He relates his experiences with operations on the head, neck, trachea, in six cases of removal of the breast, in thirteen of resection of ribs, in two vaginal hysterectomies, and in numbers of other major and minor operations—a total of 142 operations under this local anesthesia with only ten failures. The anesthesia was complete in 367; fifteen required a little supplementary chloroform. This latter group includes ten appendicectomy cases. Among the practical points mentioned is that phlegmonous tissue does not take the anesthetic by any means as well as normal tissues. He also comments on the special advantages of epinephrin in operations for hemorrhoids, as it does away entirely with the usual hemorrhage.

56. **Skin Grafts.**—Cotte and Dupasquier relate that they covered the denuded head of a young woman, who had been completely scalped, with skin grafts from a stillborn child. By the end of a few weeks not a trace of the scraps was left. They had all been absorbed without suppuration, melting away like sugar in water. Then skin from a 10 year old child, killed in an accident, was applied. This, too, was absorbed by the leukocytes in less than a month. In its place young connective tissue had formed with an attempt at cicatrization.

Presse Médicale, Paris

February 1, XXV, No. 7, pp. 65-72

59 *War Wounds and Prophylaxis of Infection. H. Vincent.—p. 65.
60 *Technic for Paravertebral Anesthesia in the Neck Region. (Anesthésie régionale.) A. D. Santoni.—p. 67.
61 Congenital Absence of Thumb. (Ectrodactylie du pouce avec intégrité du radius.) S. Mercadé.—p. 68.

February 5, No. 8, pp. 73-80

62 *Reflex Action from Irritating Vapors on the Nasal Mucosa. (Les réflexes pnéo-pnéiques et pnéo-cardiaques.) H. Roger.—p. 73.
63 *Osteitis of Tip of Petrous Portion of Temporal Bone. (L'ostéite de la pointe du rocher.) A. Jouty.—p. 76.

59. **Prophylactic Treatment of Wounds.**—This article has already been summarized, page 1009.

60. **Nerve Blocking for the Neck and Arm.**—Santoni has been studying the concentration of the anesthetic as affecting the anesthesia. He injected the anesthetic in salt solution ranging from 15 to 30 per thousand, and also in pure water. The hypotonic solutions induced the anesthesia more promptly, but it did not last over an hour, while with the hypertonic solution the effect was slower in developing but lasted longer. By this means the specific action of the anesthetic is supplemented by a secondary action, purely physical. He has found extremely useful and effectual a method of cervical-paravertebral regional anesthesia, as he describes in detail. The patient lying on his side bends his head to throw into relief

the seventh cervical spinous process. A band of intradermic infiltration is then applied 3 cm. from the median line. The needle is introduced 5 mm. above the seventh cervical, it is pushed in until it hits the transverse process. Then the needle gropes along to its upper edge and, as soon as this is felt, the tip is slanted downward at an angle of 20 or 25 degrees and the needle is worked in for another 10 or 15 mm. It is then close to the seventh pair and 3 c.c. of the 2 per cent. solution of the anesthetic (novocain or its equivalent) are injected, sending the fluid in all directions. The points to reach the other nerves are 15, 30, 45, 60, 70 and 80 mm. higher. To anesthetize them, the above procedure is repeated at the proper points.

62. **Heart and Respiratory Reflexes from Sudden Irritation of Mucosa of Air Passages.**—Roger gives a detailed description of what he calls pneo-pneic and pneo-cardiac reflexes, induced by sudden application of irritating fumes to the nasal mucosa, ammonia, ether or chloroform. The experiments were made on rabbits, the denuded carotid connected with a manometer while the respiration was recorded with a pneumograph and chromograph record on the same chart. Provision was made to ensure that the reflex action was due exclusively to the effect on the nasal mucosa, and not to deeper inhalation of the fumes. Some of the experiments were made after the vagus had been severed on both sides. The reflex consists in a respiratory spasm, arresting the respiration in expiration, with a drop in blood pressure, followed by extreme oscillations, the blood pressure finally rising above its primary level. In some of the rabbits the excitation of the nasal mucosa induced a tetanic contraction of the heart. Inhalation of chloroform or ether does not have the same effect as its sudden application. The absorption of the drug reduces the amplitude of the respiratory movements and lowers the blood pressure.

63. **Osteitis of the Petrous Portion of the Temporal Bone.**—Jouty says that the development of trigeminal neuralgia and of external oculomotor paralysis, in the course of an ordinary otitis media, shows that the tip of the petrous portion has become involved. When these two signs appear together or with a few days' interval, the diagnosis is certain. In most cases this focus of osteitis retrogresses, but if it progresses the neuralgia grows worse and an abscess forms, with danger of meningitis. Necropsy has shown meningitis in all the known fatal cases to date. In the two cases on record in which this petrous focus was suspected, the whole petrous portion was gouged out before discovering the focus in the tip. The patients recovered, but nervous disturbances and neuralgia followed from the extensive destruction of the internal ear and facial nerve. Jouty differentiated the trouble with precision in a personal case described, basing his diagnosis on the simultaneous appearance of trigeminal neuralgia and the external oculomotor paralysis. The operation was thus exclusively restricted to the apex of the petrous bone, and the patient recovered completely without damage of the internal ear or facial nerve. The first step is to ensure ample petromastoid drainage. This is better than mere trephining of the mastoid region.

Progrès Médical, Paris

February 3, XXXII, No. 5, pp. 37-44

64 Treatment of Nasal and Bronchial Asthma by Local Applications of Pituitary Solution. H. Bourgeois.—p. 37.
65 Wire to Encircle Shattered Bone. (Cerclage au fil métallique dans le traitement des éclatements des os longs par projectiles de guerre.) M. Sénéchal.—p. 38.

February 10, No. 6, pp. 45-52

66 *Paratyphoid Fevers and Dysentery. J. Carles.—p. 45.
67 Frostbite and Its Treatment with Novocained Paraffin. A. Chalier.—p. 46.
68 Snapping Hip in an Acrobat. (A propos d'un cas de hanche à ressort.) V. Combier and J. Murard.—p. 48.

66. **Paratyphoid Fevers and Dysentery.**—Carles' experience has confirmed that paratyphoid fever may deceptively simulate dysentery. It may also cause the flaring up of an old and supposedly long healed dysentery. He has encountered cases of simultaneous paratyphoid and dysentery, and others in which dysentery was followed by paratyphoid. Differentiation is almost impossible without bacteriologic examination of the blood and stools, and treatment, to be effectual, must be based on an exact diagnosis. Otherwise each disease is liable to pass into a chronic and very tenacious phase.

Correspondenz-Blatt für Schweizer Aerzte, Basel

February 10, XLVII, No. 6, pp. 161-192

69 Acute Exophthalmos with Quincke's Edema. Meyer-Hürlimann.—p. 161.
70 *Spirochete Bronchitis. (Bronchite de Castellani.) B. Galli-Valerio.—p. 169.
71 Aspirating Bougie for Esophagus and Stomach. M. Einhorn (New York).—p. 175.
72 Sulphur in Salvarsan. (Ueber eine im Salvarsan (606) in sehr geringen Mengen vorkommende Schwefelverbindung.) C. Strzyzowski.—p. 176.

70. **Spirochete Bronchitis.**—Galli-Valerio gives a list of sixteen different maladies in which spirochetes have been found, and in some were regarded as responsible for the affection. Spirochete bronchitis has been encountered in Ceylon, India, the Philippines, Europe and elsewhere, since Castellani called attention to it. Galli-Valerio has had seven cases in his practice at Lausanne. The prognosis is favorable if the treatment is energetic enough to arrest the disease before it has passed into a chronic phase. Microscopic examination of the stained sputum reveals the spirochetes; all his patients had been labeled tuberculous. In treatment he advises bed rest, keeping up the patient's strength and giving arsenic, merely Fowler's solution by the mouth or intramuscular injection of some mixture containing sodium cacodylate. He recommends also salvarsan. The disease runs an acute course in five or six days, with high fever and profuse expectoration of a whitish or yellowish sputum. Percussion is practically negative, and auscultation reveals merely disseminated râles. Headache and pains in the limbs, reduction in hemoglobin and reds, with manifest leukocytosis, are other features. The chronic form shows a hectic fever, deceptively like that of tuberculosis, with chronic cough and expectoration and sometimes actual hemoptysis, with much weakness and anemia. Untreated, it may drag along for years with intervals of improvement.

Gazzetta degli Ospedali e delle Cliniche, Milan

February 4, XXXVIII, No. 10, pp. 145-160

73 *The Blood Findings in Typhoid in the Vaccinated. (Nota riassuntiva sulle ricerche siero-diagnostiche ed emoculturali fatte nei tifosi con riguardo alle vaccinazioni antitifiche.) G. Baglioni.—p. 146.

February 8, No. 11, pp. 161-176

74 Traumatic Paralysis of Left Hypoglossal Nerve with Traumatic Neurosis of the Right Arm, Following Stab Wound of the Neck. V. Russo.—p. 161.

73. **Typhoid in the Vaccinated.**—Baglioni tested the blood of 174 typhoid patients and obtained positive agglutination with typhoid bacilli in 96, with paratyphoid *A* in 22, and *B* in 33. There was group agglutination in 8, and no agglutination of any type in 25. Typhoid bacilli were cultivated from the blood in 28 cases, paratyphoid *A* in 26 and *B* in 17, while the blood seemed to be sterile in 102. He concludes that not much reliance can be placed on the seroreactions in the vaccinated. The immunity conferred by antityphoid vaccination varies in individual cases, just as one attack of typhoid may or may not protect against another attack.

Policlinico, Rome

February 11, XXIV, No. 7, pp. 201-232

75 Abdominal Wounds in War. (Osservazioni sulle ferite addominali curate nella terza ambulanza chirurgica.) R. Bastianelli.—p. 201.
76 Test to Detect Simulation of Deafness. (Sul problema della valutazione dell'ipoacusia.) P. Mancioli.—p. 204.
77 *Advantages of Tar for Dressing Minor Wounds. (Il catrame nella chirurgica minore.) M. Pasquali.—p. 204.
78 Phenol Treatment of Tetanus. L. Cerchione.—p. 211.

February 18, No. 8, pp. 233-264

79 Physiologic Value of Alcoholic Beverages. (Precetti e preconcetti medici in fatto di alimentazione pratica. IV.) S. Baglioni.—p. 233.
80 Inflatable Pads for Local Hemostasis. (Emostasi per mezzo di pallancini elastici; abolizione del laccio emostatico.) A. L. Soresi (New York).—p. 247.

77. **Tar for Dressing Wounds.**—Pasquali calls attention to the advantages of vegetable tar poured over frostbitten feet, over burns and other torpid minor surgical processes. If necessary, it is heated a little to render it more fluid. To date there have been no untoward by-effects. The men all laud the relief from pain and itching, while the lesions seem to heal more rapidly under the tar than without. The tar does not dry out nor grow stiff, and it can be easily washed off with a little alcohol or benzin.

Brazil-Medico, Rio de Janeiro

February 10, XXXI, No. 6, pp. 43-50

81 Brazilian Method of Eliciting Achilles Tendon Reflex. (Da pesquisa do reflexo achilleo.) O. Ayres.—p. 43.
82 Heliotherapy in Brazil. A. Moncorvo, Jr.—p. 44. Continuation.

Cronica Medica, Lima

February, XXXIV, No. 644, pp. 41-76

83 Present Status of Our Knowledge of Leprosy. E. Odriozola.—p. 41.
84 *Gallstone Surgery in Peru. (Estadistica nacional en la cirugia de las vias biliares.) F. Wieland.—p. 52.
85 *The Alligator Pear Adapted for Antidiabetic Diet. (La palta como alimento de los diabeticos.) E. Escomel.—p. 67.

84. **Gallstone Surgery in Peru.**—Wieland relates that gallstone trouble requiring operative measures is comparatively rare in Peru. The first operation of the kind there was in 1904, and he has been able to find records of only twenty operations on the biliary apparatus to date. The few fatalities were due to the long delay before operative treatment was accepted.

85. **Alligator Pear in Antidiabetic Diet.**—Escomel for some years has been calling attention to the fruit of the *Persea gratissima*, a kind of laurel, as a welcome addition to the diet of diabetics. It is a common fruit and he says that it does not contain starch or sugar. His analysis showed 34.1 per cent. fat; 3.79 per cent. albuminoid substances and 3.5 per cent. ash, with 38 per cent. water, and 0.4617 per cent. phosphates. (The fruit is known as the alligator pear, avocado, vegetable marrow and midshipman's butter. An editorial was devoted to it in THE JOURNAL, March 18, 1916, p. 898.)

Revista de la Asociacion Medica Argentina

January-February, XXVI, No. 146-147, pp. 5-141

86 *Anterior Cephalocele; Three Cases. M. H. Vegas and J. M. Jorge.—p. 5.
87 *Organic Nature of Sydenham's Chorea. A. Gareiso.—p. 35.
88 *Milky Ascites. (Etio-patogenia de los derrames quilosos.) C. B. Udaonda and M. R. Castex.—p. 58.
89 *Pelvic Varicocele. C. A. Castaño.—p. 76.
90 Pigmented Retinitis with Atrophy of the Choroid and Retina. (Atrophya gyrata chorioideae et retinae.) P. Argañaraz.—p. 102.
91 *Acute Postpartum Dilatation of Stomach and Duodenum. P. Ramos.—p. 109.
92 *Sclerosis of Pulmonary Artery. (Caso de enfermedad de Ayerza.) P. M. Barlaro.—p. 121.

86. **Anterior Cephalocele.**—In each of the three cases of which an illustrated description is given, the cephalocele was between the eyes. The patients were children of 11, 6 and 1 or 2 years old. They seem normal otherwise except that the older child has contracture of the right arm and limps a little with the right leg. The parents of this child refused to permit an operation; the encephalocele extended over the root of the nose and part of the right cheek, but was not prominent enough to be very noticeable from the side. In the younger child it formed a tumor round and large as an orange which was easily removed. In the other child the tumor spread from eye to eye and a little on the cheeks, and was increasing in size. This too was easily removed. The tumors seemed to be of the nature of hernia but they evidently date from early embryonal life, before the formation of the face. Hydrocephalus does not accompany this anterior type of cephalocele, as a rule. It forms a tumor of a gelatinous consistency, and its excision was not followed by any appreciable symptoms. In the 6 year old child the cleft in the bone was so broad that Vegas and Jorge closed it with a bone periosteum flap from the eleventh rib. The tumor had reformed in this case after it had been resected three times.

87. **Organic Nature of Chorea.**—Gareiso reports that signs of encephalitis were evident in forty-nine of the fifty cases of Sydenham's chorea tested for the Babinski and other indications of organic disease. The reflex responses varied from day to day in different cases. He gives the detailed findings in twenty-eight cases. As the chorea subsided, the signs of the superficial, transient encephalitis inducing the choreic movements subsided with it.

88. **Milky Ascites.**—Cancer of the stomach and liver was the primary cause of the chylous ascites in the first of the five cases reported. In the others, aleukemic glandular disease, cancer of the stomach or tuberculous peritonitis—all chronic processes.

89. **Pelvic Varicocele.**—By this term Castaño means permanent varicose enlargement of certain veins in the female pelvis. It may be secondary or primary, and it is undoubtedly responsible for the complaints of many women who are regarded too often as merely neuropathic or hysteric. Returning varicocele at the menses may be responsible for dysmenorrhea in many cases. He reviews the literature on the subject, from Richet in 1854 to A. Wall in 1916, and discusses the clinical picture according to the vein involved. The women affected are full-blooded, inclined to constipation, and minor thyroid insufficiency. For the same reasons as in men, the left side is predominantly affected. Girls inclined to overstudy and neglect hygiene bring on this congestion in the pelvic organs, starting the varicocele. Sitting on a hard piano stool for hours to practice, without heed to menstruation, also favors local congestion. It is easily corrected at first by repose, but after the veins become enlarged the varicocele is rebellious to simple measures. Other factors may be long standing, running the sewing machine, excessive dancing and tight lacing, erotic stimulation from plays, moving pictures, etc. Mechanical, anatomic, infectious and constitutional factors may afford a predisposition.

91. **Acute Dilatation of the Stomach Postpartum.**—Ramos cites from the literature of the last nine years seventeen cases of acute gastroduodenal dilatation following childbirth. He then describes a case from his own practice. His experience in this case enabled him to make a retrospective diagnosis of a similar case a few years before in which at the time the condition was not recognized. The dilatation may occur from paralysis of the stomach or from occlusion of the mesenteric artery, but probably both factors are associated and aggravate each other. Labor in his case had been brief but the midwife had repeatedly tried to expel the afterbirth by expression. Ramos finally had to remove it by hand, without anesthesia. He left the woman in good condition but he was recalled in four hours as she was vomiting constantly and suffering from extreme thirst, the pulse 140, thready, the expression anguished. She said her stomach felt as if there was an iron bar in it. The condition grew worse every minute until the woman was turned to lie on her stomach in the knee-chest position, when gases rushed out of the stomach with a continuous rumble, the abdomen sank in, and the whole clinical picture cleared up as by magic. He thinks it probable that many instances of acute postpartum dilatation of the stomach have been masked by the obstetric conditions and have escaped recognition. The abrupt changes in the intra-abdominal pressure and the manipulations during the third stage of labor are liable to induce the arteriomesenteric occlusion. In his case the peristalsis observed in the stomach and the sudden disappearance of the disturbances indicate that probably constriction of the duodenum was the primary trouble and not paralysis of the stomach.

92. **Sclerosis of Pulmonary Artery.**—Barlaro describes a case of what he calls Ayerza's disease, in a woman of 44. The face was very cyanotic, pulse 80, regular, the right heart dilated. The red count was 6,680,000. She had usually three attacks of dyspnea during the twenty-four hours, relieved by expectoration. This had been going on for three years. Occasionally there was blood in the sputum. She was inclined to be chilly and her feet were always cold. Barlaro gives a roentgenogram of the case and discusses the various affections with which this clinical picture from sclerosis of the pulmonary artery is liable to be confused. Syphilis is prob-

ably responsible for the trouble in many cases; this was evident in the case here described. Barlaro adds that probably some of the cases were of this type which have been recorded as primary and chronic myelogenous polycythemia —Vaquez' disease—especially in the form with enlargement of the spleen. This is particularly likely in the cases with chronic bronchial catarrh or pulmonary emphysema or a persisting cough through two or more years, with blood at times in the sputum.

Siglo Medico, Madrid

February 17, LXIV, No. 3297, pp. 97-112

93 *Morphology of the Blood in Leprosy. S. de Buen.—p. 98. Commenced in No. 3296, p. 82.
94 Rebuilding the Face. (Las restauraciones buco-faciales.) F. Aguilar.—p. 105. Continuation.

93. **The Blood in Leprosy.**—De Buen gives the blood findings in thirty-six lepers in Granada. No special leukocyte formula could be discovered and eosinophilia was not common. Mononucleosis was frequent, and Arneth's index was displaced toward the left, but no data of importance could be deduced from the red or white count.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

January 27, I, No. 4, pp. 201-272

95 *Eosinophilia, Anaphylaxis and the Nervous System. D. Klinkert. —p. 202.
96 Family Care of the Insane. (Een nieuwe richting in de verpleging der geesteszieken.) J. L. Van Lier.—p. 213.
97 Resin-Containing Substances in Treatment of Wounds. (Harshoudende geneesmiddelen bij wondbehandeling.) P. Van der Wielen. —p. 221.
98 Brain Abscess Consecutive to Frontal and Ethmoidal Sinusitis; Two Cases. H. J. L. Struycken.—p. 224.

95. **Anaphylaxis, Allergy and the Nervous System.**—Klinkert presents an array of arguments to prove that all the mysteries of eosinophilia and anaphylaxis can be explained by assuming that the nervous system in certain persons is exceptionally sensitive. It reacts to irritation below the threshold of reaction in the normal. It may be naturally thus abnormally irritable or the irritability may be from cumulative action of toxins. The only difference between an idiosyncrasy to a drug and the phenomena of anaphylaxis is one of degree. With the drug idiosyncrasy, the phenomena occur at once, while with the phenomena we call anaphylaxis there has to be time for cumulative action, the albuminous substances inducing the reaction not passing off through the kidneys but accumulating until the hypersusceptible nervous system is finally overcome by their toxic action. He explains how all the phenomena in question are of unmistakable nervous origin. This is particularly evident in the changes in the skin around the area where a tuberculin salve is rubbed on the skin of a tuberculous child, and the appearance of an entirely symmetrical reaction on the corresponding area on the other half of the body. Other evidence is the reaction in the other eye also when tuberculin is instilled into one eye. Everything indicates that the Pirquet tuberculin reaction is an angioneurotic process. This explains the local eosinophilia, as this is the faithful accompaniment of all conditions of irritation in the secretory nervous apparatus. That part of the nervous system which is the most susceptible feels the effect of the irritation first and foremost, and we thus encounter anaphylactic asthma or enteritis, convulsions, urticaria, hyperesthesia of the skin or prurigo, epilepsy or clinical neuroses as the case may be. Intermittent swelling of the joints, as with serum sickness, must also be regarded as a neuro-arthritis. He explains how the manifestations of Poncet's tuberculous rheumatism, anaphylactic shock, and the natural and the acquired idiosyncrasy to horse serum all fit into this frame of nervous allergy. The albumin in the alien serum is not passed off as such through the kidneys and it irritates the nervous system. On injection of the antigen, the phenomena of shock and the fixation of the specific ferments occur almost simultaneously, and this fact has been erroneously interpreted to mean that there is a direct causal relation between them. The truth is, rather, that on account of the speed with which the phenomena of the nervous shock develop, the defensive mechanism of the specific ferments has no opportunity to afford effectual aid. In conclusion Klinkert discusses the so-called passive anaphylaxis, showing that it is in reality an active anaphylaxis. He also presents evidence to prove that the phase of anti-anaphylaxis is merely a phase of exhaustion on the part of the nervous system. The result is a refractory phase. The condition of allergy, he reiterates in conclusion, is not an element in immunity. It is the consequence of the cumulative action of toxins on the nervous system.

Hospitalstidende, Copenhagen

January 24, LX, No. 4, pp. 73-96

99 *Measuring and Recording Movements Possible to a Joint. (Om Maaling af Leddenes Bevægelsesforhold.) J. Helweg and G. Wiltrup.—p. 73.

January 31, No. 5, pp. 97-120

100 The Uric Acid Diathesis. (Undersøgelser over den urinsure Diatese.) I. P. Chrom.—p. 97.

99. **Curve of Motor Range of Joints.**—Helweg and Wiltrup expatiate on the advantages of an exact record of the movements possible to a diseased joint. Such curves aid not only in diagnosis and prognosis but also as a guide to treatment. They analyze the movements of the principal joints and give a table recording the range of movements in a typical case. They measure the movements always as starting from the position of the joint in the attitude of military attention, erect, or reclining horizontal, the arms close to the sides, the palms against the thighs, the legs extended, the feet at right angles to the leg. The movement of the joint from this starting position is recorded by the figure of the angle when normal movements are impossible.

Hygiea, Stockholm

January 31, LXXIX, No. 2, pp. 49-96

101 *War Injuries Affecting Voice and Speech. (Om krigsskador å röst- och talorganen.) E. Stangenberg.—p. 49.
102 *Case of Scarlatinal Mastoiditis with Arrosion of Sinus Wall and Fatal Spontaneous Hemorrhages. A. Hæggström.—p. 58.

101. **War Injuries of Voice and Speech.**—Stangenberg was sent to Berlin to study in particular war wounds and functional neuroses affecting the organs of speech. His investigations were mainly in Gutzmann's service where 426 patients of this class have been under treatment. He describes a few typical cases of spastic dysarthria in previously healthy men who were much improved but not cured by over five months of exercises in speaking. One officer after a shell shock and minor injuries had complete aphasia, dysarthria and dysphasia, with no improvement to date under eight months of treatment. The results on the whole are meager, and treatment requires great skill and extreme patience.

102. **Hemorrhage from Scarlatinal Mastoiditis.**—The girl of 7 developed otitis media in the course of scarlet fever with continuous high temperature. By the second day of the otitis an operation for mastoiditis became necessary. Six days later there were profuse hemorrhages from the fistula and necropsy showed the side wall of the sigmoid sinus completely arroded. The hole, as large as a pea, was in the wall of the sinus where it had been exposed at the operation. It had been apparently sound then. There was no thrombosis except in the bulb of the jugular vein. Ligation of the jugular vein on account of the thrombosis was followed by profuse hemorrhage and the child died a few days later. Hæggström has found twenty-five similar cases recorded in the literature, in which osteitis of the sinus led to spontaneous hemorrhage. In five of the ten acute cases, scarlet fever was responsible. Eulenstein advises in such a case to expose the transverse sinus and apply compression to it, and then to open up the mastoid process and seek the bleeding vessel and tampon it at the spot. His patient given this treatment recovered. On the other hand, if the bleeding comes from the arroded sinus not long after a mastoid operation, an ordinary compressing bandage may prove all that is necessary. Two-thirds of the patients treated in this way recovered. It would be safer, however, Hæggström adds, judging from his own case, to compress the sinus by working a tampon between the dura and the wall of the sinus from a trephining opening made over the transverse sinus.